COMMERCIAL FERTILIZER

CONSOLIDATED WITH THE FERTILIZER GREEN BOOK

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A GOOD COTTON YEAR

FOR YOU?

Barrett advertising in Southern farm magazines is urging farmers to use these approved practices to make 1950 a good cotton year—

1. Prepare the land well. Plant about one bushel of top-quality seed per acre, after danger of cold weather has passed.
2. **At planting, apply fertilizer in bands, using 500 to 800 pounds of 4-10-6, 6-8-6, 5-10-10 or 7-7-7 per acre.**
3. **At chopping time, side-dress each acre with 250 pounds of ARCADIAN*, *the American* Nitrate of Soda.**
4. Thin to two or three plants per foot. Cultivate as frequently as needed to keep out weeds. Use a complete insect control program, dusting or spraying as often as necessary to prevent crop damage by pests. Defoliate when bolls are formed.

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MARCH, 1950

1850 1950

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Agricultural Pentahydrate
Borax

Contains a minimum of 44% B_2O_3 or approximately 121% equivalent Borax. More economical in this concentrated form when used as an addition to fertilizer or for direct application to the soil, to correct a deficiency of Boron. Consult your local County Agent or State Experimental Station.

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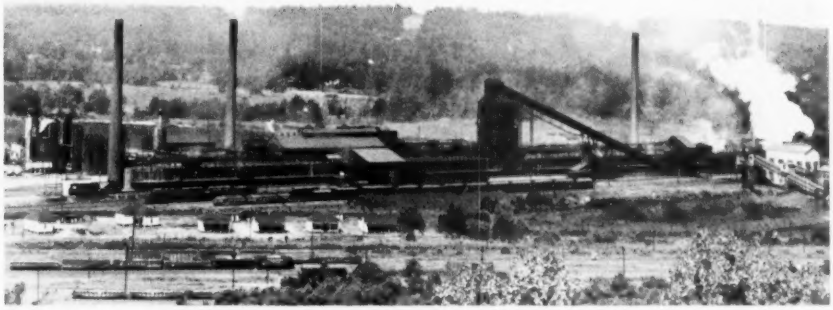

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COMMERCIAL FERTILIZER

ESTABLISHED 1910

March, 1950

Volume 80, No. 3

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JUST AROUND THE CORNER

By Vernon Mount

The British election suggests a ray of hope in a world that seemingly has been trending to the radical side. The Labor victory is hollow, with an unworkable division of power. It suggests that the average Briton is willing for Santa Claus to be killed a little, at any rate.

Let's hope it helps here. Some of our more radical and do-good politicians on this side of the water will be deeply impressed by the British result, though they will deny it has any bearing.

Perhaps it's not too late to reverse the trend in the U. S., and assure ourselves at least of a Congress that has a decent balance in favor of rational conservatism. As I pointed out in January, the margin is very narrow, and the election this year could put the rabble in the saddle all the way.

Education of the people is a job for every thinking American to undertake. Don't say you don't count. Get out and talk to the voters, quietly, one at a time-- and show them that Free Enterprise is not a smoke-screen for rapacious profit, but the system that made automobiles, telephones and $500 television sets commonplace in American homes.

If you don't want to be nationalized--better get busy now.

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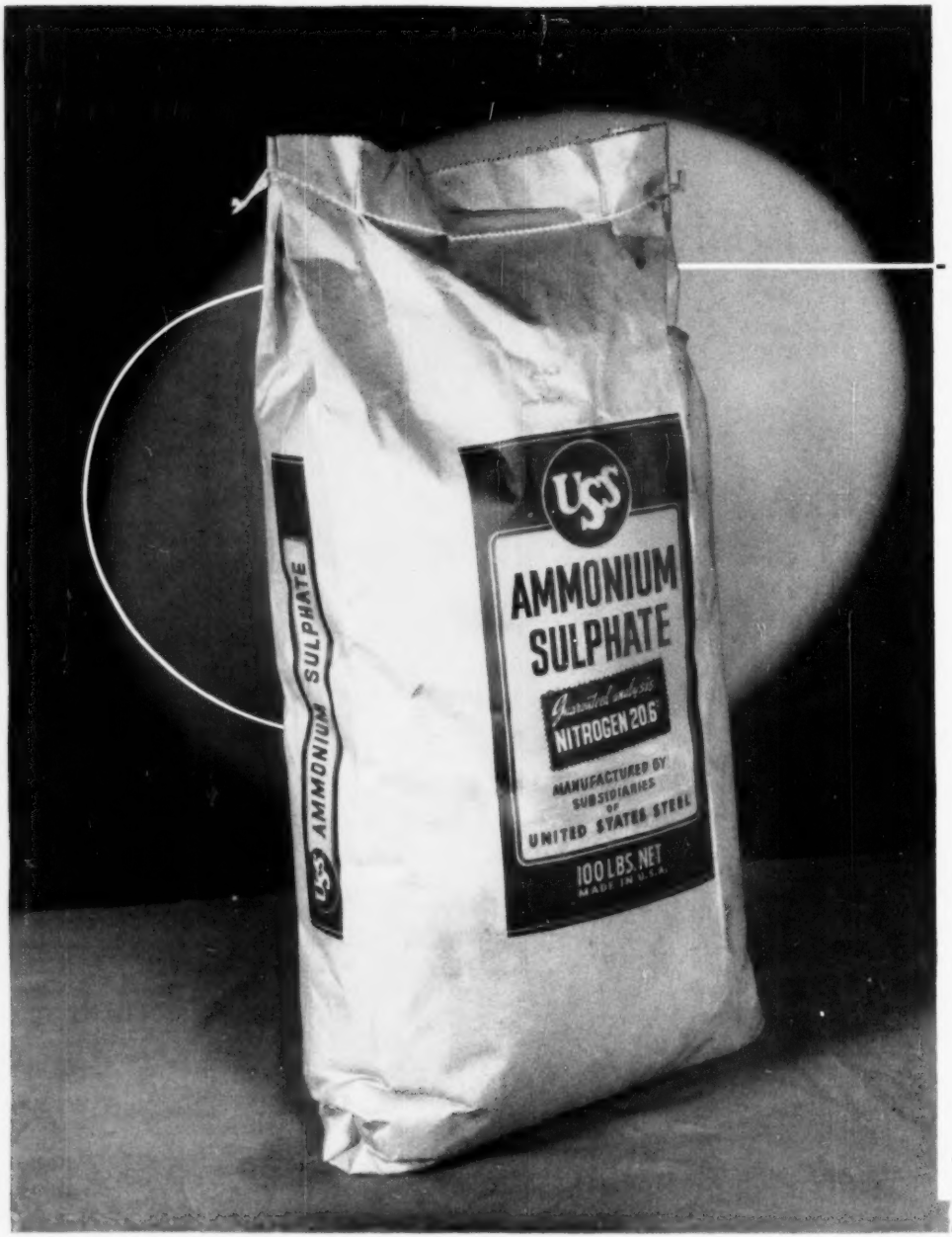
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AMMONIUM SULPHATE
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U·S·S Ammonium Sulphate

IN 100-POUND BAGS FOR DIRECT APPLICATION

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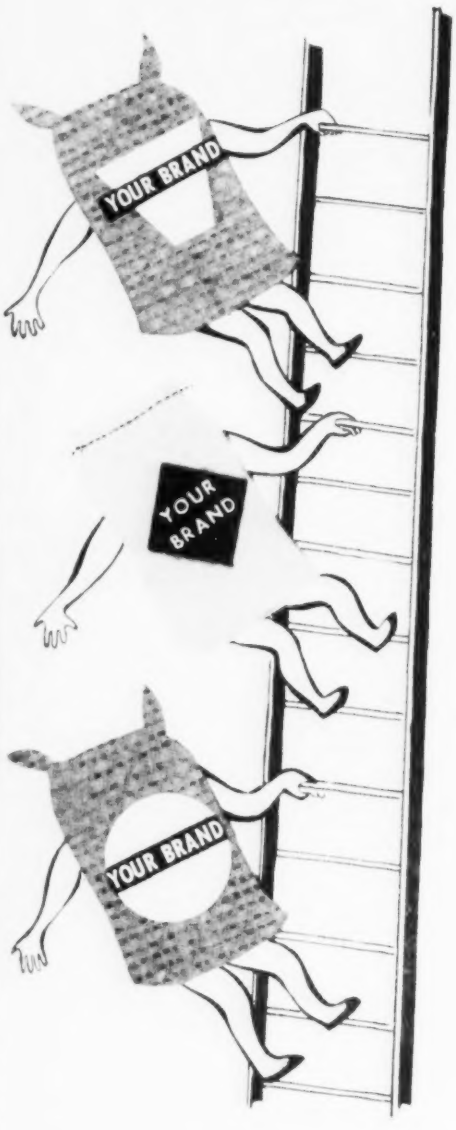

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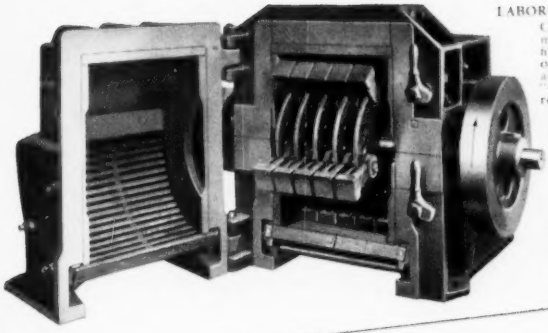

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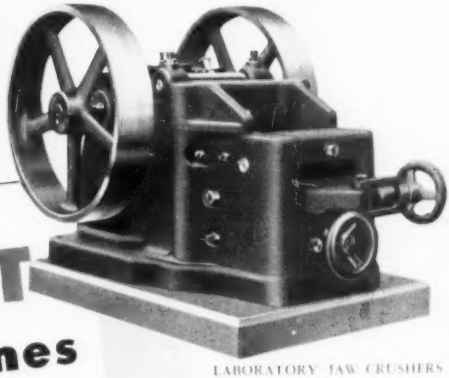

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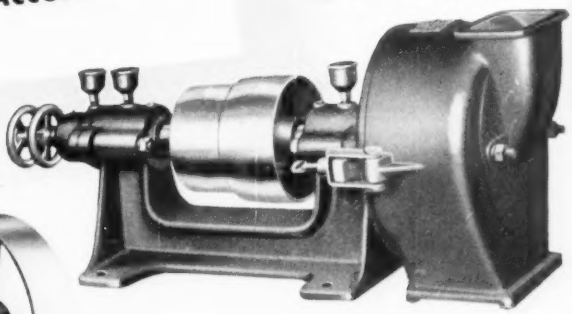

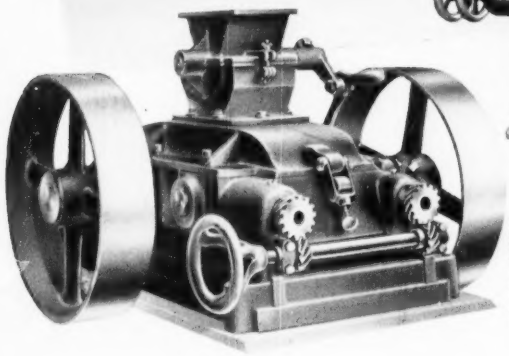

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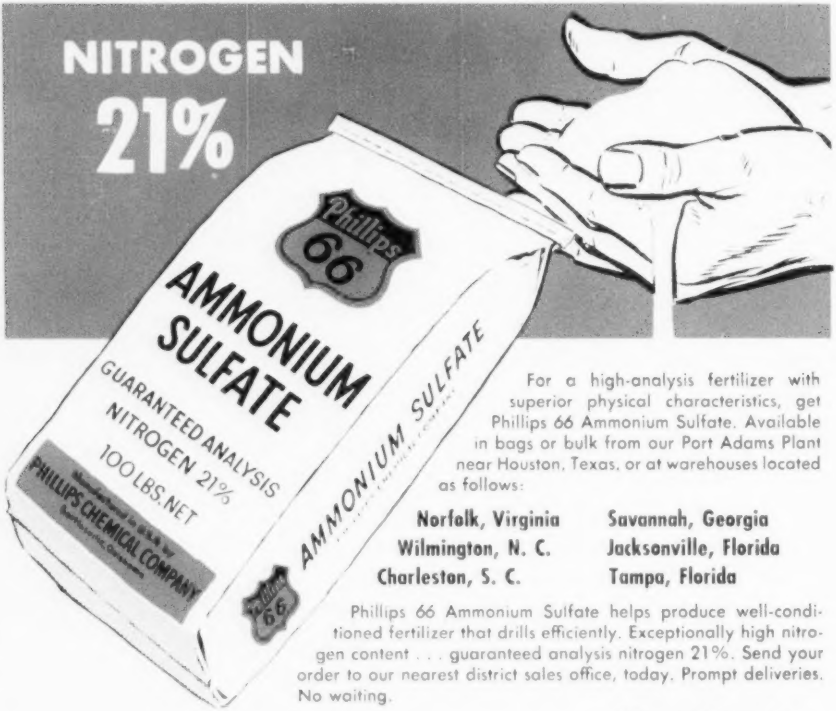
Phillips 66 Ammonium Sulfate has uniform crystals, resists caking, flows freely!



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Phillips 66

NFA Convention Plans Reported

One of the most important conventions in the long history of The National Fertilizer Association will be held at the Greenbrier, White Sulphur Springs, West Virginia, June 12-14. The program and other activities of the meeting will be built around the general theme "A Century of Progress with Fertilizer."

In addition to distinguished speakers from the ranks of agriculture, business and government, the Association has planned other special features. Members and contributors have shown interest in NFA's invitation to display exhibits illustrating the progress which has been made during the industry's century of achievement. Other features of the centennial meeting will be publicized in later issues of Commercial Fertilizer.

Those who have already accepted the Association's invitation to address the convention are: Allan B. Kline, president, American Farm Bureau Federation, "A Century of Progress on the Farm;" Robert M. Salter, chief, Bureau of Plant Industry, Soils and Agricultural Engineering, U. S. Department of Agriculture, "A Century of Progress in Fertilizer Research;" and Ralph Robey, chief economist, National Association of Manufacturers, "A Century of Progress in our Country's Economy."

The Plant Food Research Committee of the Association will present a panel on "A Century of Progress in Compounding and Utilizing Fertilizers," with the following among those who will participate: H. B. Siems, director of research, Plant Food Division, Swift & Company; S. D. Gray, northeast manager, American Potash Institute; H. H. Tucker, president, Coke Oven Ammonia Research Bureau; K. D. Jacob, head, Division of Fertilizer and Agricultural Lime, Bureau of Plant Industry, Soils and Agricultural Engineering, U. S. Department of Agriculture; and Vincent Sauchelli, director, Agricultural Research, Division Chemical Corporation.

Annual addresses will be delivered by Ray King, chairman of the Board of Directors of NFA, and by Russell Coleman, president.

It Seems to Me

by BRUCE MORAN

I have been asked by several what I meant by the last line of last month's "It Seems to Me." We were talking about efforts to help hungry peoples by beginning with the individual farmer, and I ended: "That's our job, not only abroad, but right here at home."

A quote from this column may illuminate this: In December we said "If all of us go at this task with evangelistic fervor . . . we'll be faced with the need not to retrench, but to start toward a program of forty instead of twenty million tons a year." At the time that was written a visitor with a lifetime of experience in agronomy commented "You were smart not to put the date on that forty million ton figure." Which is, of course, correct.

But it can be done. It may happen despite lethargy in the industry. We may be forced into it by the bald fact that there is no new, fresh land to which the farmers can move, and our product is the only way they can keep the food rolling in.

It can be done soon. Sooner if we use every device of the many at our command to teach the individual farmer that his soil is a reservoir of plant nutrients which he can drain only as the level is maintained by replacement of plant foods as the crops take them up.

It is a selling job, a job of education. It is not easy. But it can be done; it can be done soon; and it can push our mark up to that forty million figure I mentioned as 1949 closed.

I'm still not saying when, but I believe my younger readers will see it—and perhaps they are the boys to make it happen.

A FERTILIZER CENTENNIAL FEATURE

Review of NFA's

Soon the Governors of the 48 states, members of the Congress and other leaders in agriculture, industry and government will be getting an impressive book, well written, well illustrated, nicely dressed up in color. This is the keystone of the fertilizer centennial celebration, the fountainhead of data and inspiration on which to base publicity, speeches and other material used in local celebrations of the event, such as we wrote about in the February issue of Commercial Fertilizer Magazine.

We have before us an advance proof of this book. Let's see what's in it, so you can judge how you can use it in your own centennial activity.

Harry Truman leads it off with a friendly letter to Ray King, NFA Chairman . . . "Your resourceful industry . . . has responded to the situation . . . and we are now able to grow bigger and better crops and livestock than ever before."

Ray King writes a foreword in which he points out that USDA gives our industry credit for fully 20% of agricultural production.

A quick check-list of historic fertilizer dates is supplied, from those original two barrels of Peruvian guano which reached Baltimore in 1824 to the 1943 date of the first commercial use of anhydrous ammonia directly in the soil. And the first patent, issued to the two Chappells of Baltimore for a compounded fertilizer, is cited.

The lead feature is by R. M. Salter, of Beltsville, and a few quotes will give you a desire to read the whole thing, and use it, too: "The last ten years have witnessed a sharp rise in average acre yields in the United States . . . and in the same period the total tonnage of plant nutrients applied as fertilizers has more than doubled. These increases . . . are of course related, but expanded fertilizer use was only one of several factors." He goes on to mention the progress in hybrids and varieties, better farm machinery, new weed and insect control methods. He speaks of the importance of soil, water and the genetic makeup of the plant itself in this connection—and how important is a more nearly optimum levels of fertilizer use. He reaches the conclusion that: " . . . the expectation is justified that over the long pull the use of fertilizers will climb to successively higher levels."

This article includes a discussion of nitrogen, cites a need "for the development of high-analysis, solid products having better physical properties and greater resistance to leaching . . . " A quote from the Phosphate section: " . . . further marked expansion in the output of concentrated superphosphate can be expected." The Potash section cites "A major advance . . . is the production of nearly pure potassium chloride . . . " Calcium, sulfur, magnesium, boron, copper, manganese and zinc as important elements are discussed.

The increase in plant nutrient percentage from 13.9 in 1920 to the present 22 percent is listed as an important development. The physical conditioning of mixed fertilizer and the new subject of granulation is included, as is the matter of better packaging for closer control of moisture content.

Dr. Salter's final point is that the cost of fertilizer to the farmer has risen only 23 points while such items as feed, 124 points, and all commodities, 108 points, have risen sharply—and the low price of fertilizer is shown even more definitely when compared to the 131 point rise in prices received by the farmer for his crops.

Herman W. Steinkraus, president of the U. S. Chamber of Commerce, approaches our industry from the viewpoint of its relationship to the national

Centennial Brochure

economy. "The fertilizer industry has occupied and seems destined to occupy an increasingly significant place in the national economy" he writes. Without fertilizer soil depletion in the older farming sections would

First of the Governors to proclaim Pasture Year, Elbert N. Carvel, Governor of Delaware and prominent fertilizer manufacturer, called on the other 47 governors to issue similar proclamations.

have limited production increased costs, inflated food and raw material prices, lowered dietary standards, lowered levels of health and productive efficiency among workers, and generally lowered the level of national industrial productivity.

". . . the industry has for the past century been one of the major agencies working toward a more productive and efficient agriculture. By so doing it has undoubtedly contributed to a greater stability in the economy as a whole."

Louis Bromfield, writer and farmer, is given an opportunity once more to air his views on humus. His attitude in this article is that fertilizer is admirable as a "starter" for grasses and legumes which may be plowed in; that "luck" plays no part any more in the margin between success and failure on a farm, and that a good farmer is one who can take poor soils and make them "highly and eternally productive." That's boiling it down pretty sharply, and you should read the whole article, because it is constructive, if highly flavored with the Bromfield bias.

Gordon R. Clapp, chairman of the TVA writes on our industry and conservation. "The swelling tide of public concern for the future of our soils will probably affect the fertilizer industry more in its next one hundred years than any influence, technical or social, felt during its first hundred years" he writes.

The time is coming fast when laymen generally will recognize the vital importance of conservation to their personal welfare. This places on the fertilizer industry a very heavy responsibility as the supplies of an ingredient indispensable for soil conservation. Some other quotes: ". . . farm people are beginning to see that fertilizer can become a bulwark of lasting soil fertility . . . this should mean a greatly expanded market, perhaps as much as three to four times the present market for certain materials, provided the industry produces the kind of materials needed."

Allan B. Kline, president of American Farm Bureau Federation, in a brief statement makes these highly quotable points: "We have been hard on the soil and we have greatly increased in number . . . The abundance of the soils of the future can be equivalent to discovery of another America, but only through the wise use of fertilizers . . . Fertilizers need to carry more and more of the whole load of feeding a crop . . . Sound soil management requires intelligent use of fertilizers . . . (the farmer) can't milk his cows one day and omit the next, or fertilize his soil only in the boom years."

Albert S. Goss, Master, the National Grange also writes a short message from which these quotes are extracted: "The solution in early days was to move on to new lands . . . if any land is now exhausted there is no new land to replace it . . .

(Continued on Page 60)

ARKANSAS FARMERS PLANT IN OPERATION

By S. W. Ellis

The Arkansas Farmers Plant Food Company symbolized its ownership by members of the Arkansas Farmers Association when the formal opening of its recently completed mixing plant at North Little Rock, was held during the association convention, February 6th.

While 1,000 of the 3,000 farmer stockholders watched, the eight-man second shift turned out 600 bags of fertilizer in an hour. The plant's full capacity is 400 tons per eight-hour shift.

One of the most modern plants in the country, it had its beginning when the Arkansas Farmers' Association and the Arkansas Farm Bureau invited farmers, in every county, in May, 1949, to buy stock at $15 per share. Each share entitled the holder to buy one ton of scarce fertilizer at the market price.

Within two months, $415,000 was on deposit for building the plant. Of this sum, only $362,000 was spent to construct and equip a building with floor space of 46,000 square feet on the ground floor, located on a ten-acre site in the industrial area of North Little Rock, five blocks off the main highway between Little Rock and Memphis, Tenn.

Ground was broken on June 28th. Power for limited operation was turned on November 21. The plant is now running at full capacity, working three shifts of eight men and foreman, turning out both bulk and bagged fertilizer.

The plant is fully mechanized to handle materials from cars to storage, and from storage through basing operations, and back into storage, the entire operation done by belt conveyors and Hough Payloaders.

A series of assembly hoppers are kept full of raw materials by the Payloaders. Materials are properly weighed through hopper scales, and discharged into a belt conveyor, which delivers to the basing unit. Fifty tons per hour can be based and returned to storage.

The manufacturing units are so designed that by the use of Y valves, materials can be handled to bagging hoppers or to conveyor belt for loading bulk to customers' trucks or cars.

Bagging operations are on the second floor. From the sewing machine slat conveyor, bags are carried by belt conveyor to truck or cars.

M. D. Broadfield, general manager, said that in designing the plant, he tried to leave out all the "don'ts" he had learned during his twenty years of building and operating fertilizer plants. This is evidenced by the completely enclosed dock or working platform, where all labor is protected from the weather; by the installation of toilets on the dock floor; time clock within the building; and various other small items designed to add efficiency and save time throughout all operations.

Plans for the construction of the all-steel and concrete building were drawn by E. K. Thomason, Chief Engineer of the Atlanta Utility Works, East Point Ga., who furnished all fertilizer machinery. The Arkansas Foundry Co., Little Rock, furnished the steel; Fagan Electric Co., Little Rock, the electrical wiring; Joyce-Wooten Company the concrete work.

Totally enclosed motors and starters are used on all equipment. The building is covered with Plasteel corrugated siding and V-beam roofing, a product of the Plasteel Corporation, Washington, Pa.

All construction work was done under the supervision of Mr. Broadfield.

After the 1,000 visiting stockholders saw the plant on opening day, all of them agreed that they had made a sound investment. It is now estimated that the plant that cost only $362,000 complete is worth $500,000.

When the plans were first drawn, a committee took them on a tour of fertilizer plant-checking in many states. They returned home satisfied that the plans would give them a completely modern plant. Before any contract was let, a minimum of three bids was secured.

The main plant, 155 feet wide and 300 feet long, is situated on the ten-acre site to provide room for a future extension or leanto. That planning providing for

(Continued on Page 39)

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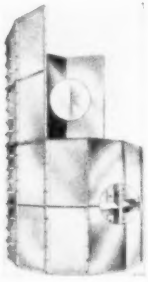

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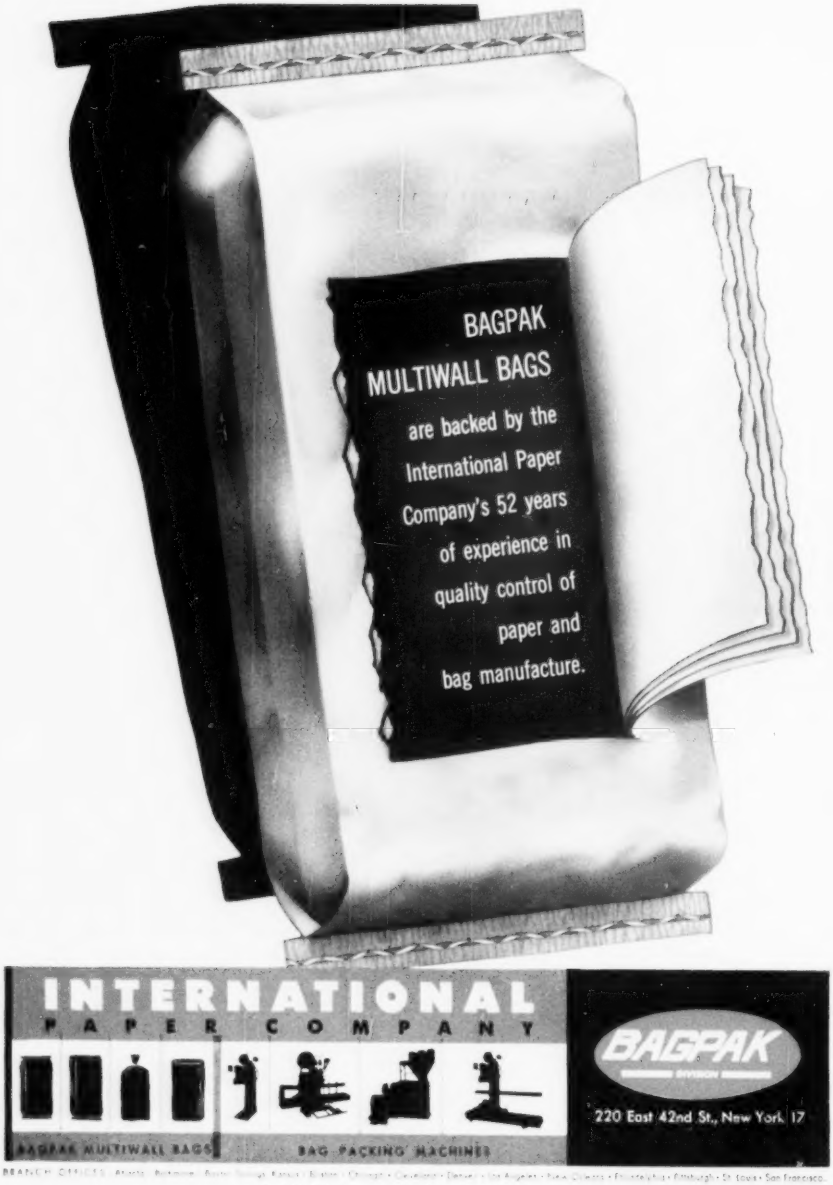
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Granulation of

By John Higson Smith
Leader of the United Kingdom Fertilizer Team
which visited the United States in November-December, 1949

For some years before the World War a small proportion of the commercial fertilizers sold in Great Britain had been produced in the granular form, and this dustless, free flowing type of fertilizer had become increasingly popular with the farmers, especially for use in combine drills in which both seed and fertilizer were sown together in one operation.

In the early days of the war the need for increasing the country's homegrown food became more and more urgent as the submarine blockade intensified, and fertilizer manufacturers were encouraged to increase their output to the maximum and to do this where possible without any great extension to the existing plants. This meant that the period of conditioning of the heaps of powdered fertilizer must be made as short as possible in order to use the available floor space to the best advantage; but owing to the fact that sulphate of ammonia is used as the chief source of nitrogen, considerable difficulty was caused by the mixtures setting after being bagged.

This fact, together with the increasing demand from the farmers for granular fertilizers, compelled the British manufacturer to turn his attention to this new form of mixing, in which, instead of using drying agents and natural organics to gain condition (which in any case were in short supply), the reaction between the superphosphate and other materials is actually encouraged to take place as quickly and completely as possible by the addition of water; and then by subjecting the mass to a rolling action, regularly shaped spherical granules are produced which, when dried, will flow freely and drill easily.

In the early granulating units the materials necessary to obtain and guaranteed analysis were weighed and conveyed to a mixer without previous preparation, but it was found that separation of the constituents took place and that the larger granules contained an unduly high proportion of P_2O_5 while the smaller granules and the "fines" were higher in nitrogen and potash. Experiments proved that in order to obtain regularity of analysis the raw materials must be prepared for mixing by crushing and screening to a uniform size, 1/4" to 3/16" screens being generally used for this purpose, but obviously, the finer the grinding at this point the better will be the mixing at the next step of the operation.

All the original granulating plants in Britain incorporated the Eirich type of mixer in which the materials are wetted and partial granulation takes place. This mixer is a flat circular pan which rotates clockwise and is fitted with stirring forks moving in the opposite direction but in the same plane. Scrapers prevent the mass from adhering to the sides of the pan and an intimate and complete mixing is quickly obtained. A central door in the floor of the pan discharges the semi-granulated mixture to a concurrent hot air rotary dryer, usually fitted with a thermostatically controlled automatic stoker, from which the granules emerge with a moisture content of from 2 to 4 percent. The temperature gradient in the drier, the flow of air through the drier and rate of drying vary widely in British practice, and experimental work is still being done to determine optimum conditions.

It will be realized that an intermittent feed to the drier is not conducive to economic working and in many plants now the prepared materials are fed to a rotary batch mixer of the type used for making powdered fertilizers and the mixture is conveyed to a smooth-

Fertilizer in Great Britian

ing hopper large enough to hold sufficient of the powdered compound to give a continuous and regular feed, by means of a gate control, to the conditioner or granulating unit.

This is a rotating cylinder inclined about 3° from the horizontal and fitted with sprays through which about 8% of water is added to the powder at the point of entry. The wetted mix rolls its way down the granulator and assumes a spherical shape by the time it reaches the outlet, from which it passes to the drier described above. The dried granules are then screened to remove the oversize, which, if the granulating has been efficiently done, should not exceed 10% of the total. The disposal of this varies in different units, but the general practice is to crack by means of a cage type disintegrator, and return it to the drier.

Although there is still some difference of opinion as to the optimum grading, the normal size of the granules sold in the United Kingdom range between one and four millimeters in diameter.

The material which passes through the coarse screen is next cooled in a counter current air cooler to as low a temperature as possible and is then again screened to remove the dust and fines, which again, should not exceed 10%. These are conveyed, together with any dust extracted from the system, either to the batch mixer, or to the smoothing hopper to be regranulated.

Provided that the cooling has been efficient and the finished product is not more than a few degrees higher than the ambient temperature, it can be filled direct into paper bags of suitable type. Jute, hessian or burlap bags are not to be recommended for direct bagging, but these can safely be used when the material has been stockpiled and allowed to stand for a few days. This obviates the possible danger of bag rot, a condition about which there is still some argument as to the cause. It is sufficient to say that by the action of acid gases, either in the granule as made, or their later evolution as chemical action is completed, there is undoubtedly a danger of deterioration of the fibres of the bagging material if the granules are not sufficiently cooled. It is also of interest to note that a suitable resistant cotton should be used in making and closing paper sacks if the open mouthed type is used.

Both in the stored bag and in the stockpile a very limited degree of "set" does take place, but this is normally no more than the mutual crystallization of adjacent granules and will be easily and completely broken down in the normal handling of the bag from the farmers store to the fertilizer distributor; or in the case of stock piled material the usual processes for reclaiming will shake the heap sufficiently to break up the set and leave a free flowing granular mass.

Although the foregoing represents a picture of standard granulating practice in Britain at the present time, there is still much experimental work being done, and an interesting paper was recently read before the Fertilizer Society of Great Britain describing a new technique for making a granular commercial fertilizer direct from salts, sulphuric acid and phosphate rock.

British manufacturers have

ASSOCIATION REPORTS ISSUE DEFERRED

We have said that our March issue would include reports on the activities both of the California and the Canadian fertilizer associations. This material had not been completed as this issue went to press, and we are extending the publication date in order that the officials of both associations may have more time to tell their stories fully.

DATA SHEET

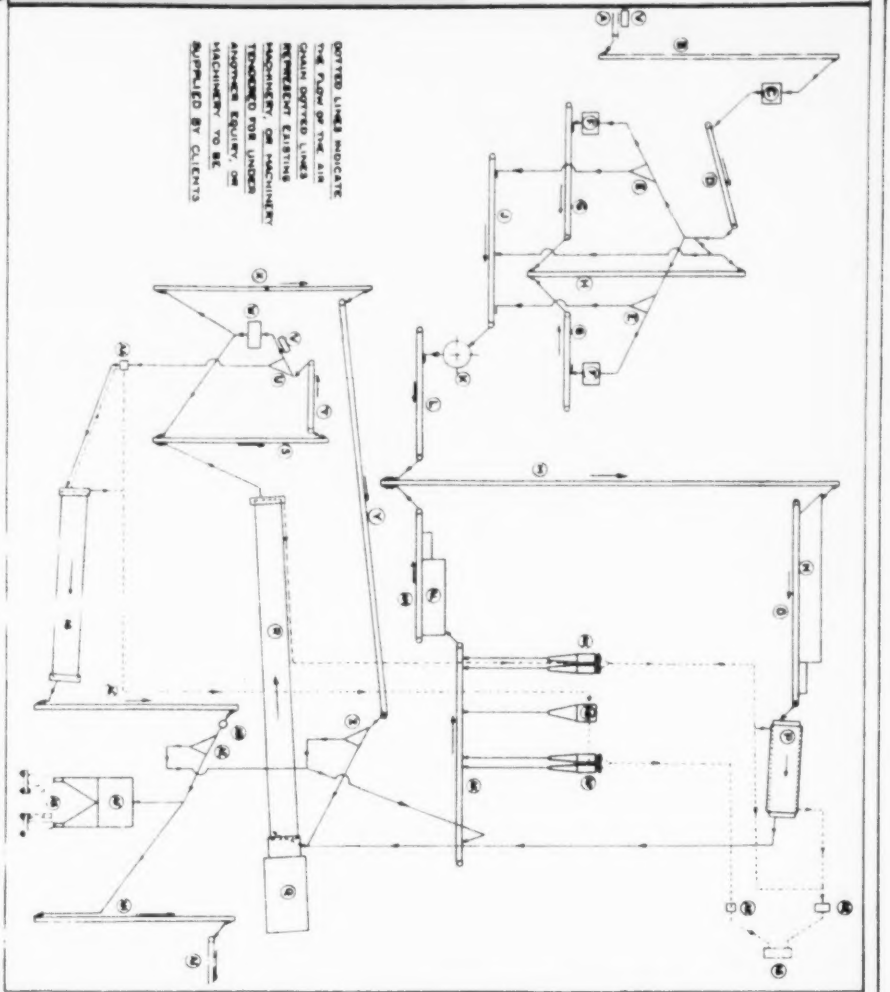
APPROX H.P.	REF	DESCRIPTION
	A	CONVEYOR
	B	ELEVATOR No 1
10	C	PRELIMINARY BREAKER
	D	SCREEN CONVEYOR
2@5	E	VIBRATING SCREENS
2@7½ 2@15	F	PULVERISER
2@3	G	PULVERISER CONVEYORS
5	H	CIRCULATING ELEVATOR
3	J	COLLECTOR BELT
10	K	BATCH MIXER
3	L	STORAGE CONVEYOR
5	M	STORAGE ELEVATOR
	N	STORAGE HOPPER
7½	O	FEEDER CONVEYOR
6	P	ROTARY CONDITIONER
	Q	FURNACE
25	R	ROTARY DRYER
3	S	CIRCULATING ELEVATOR
3	T	OVERSIZE SCREEN CONVEYOR
5	U	OVERSIZE SCREEN
	V	MAGNET
2@6	W	CRACKER MILL
3	X	CRACKED MATERIAL ELEVATOR
3	Y	CRACKED MATERIAL CONVEYOR
5	Z	FINES SCREEN
	AA	ASPIRATOR TRAP
15	AB	ROTARY COOLER
3	AC	COOLED MATERIAL ELEVATOR
	AD	SAMPLER
5	AE	FINES SCREEN
	AF	BACKING OFF HOPPER
	AG	PLATFORM WEIGHERS
3	AH	GRANULES ELEVATOR
	AJ	GRANULES STORE CONVEYOR
3	AK	FINES CONVEYOR
	AL	SMOOTHING HOPPER
3	AM	FEEDER CONVEYOR
	AN	DRYER CYCLONES
	AO	ASPIRATOR BOX
	AP	COOLER CYCLONES
50	AQ	DRYER FAN
25	AR	COOLER FAN
	AS	WASH TOWER
TOTAL	285½	

FLOW DIAGRAM REF. TABLE.

DATA SHEET

No. 113A

DOTTED LINES INDICATE THE FLOW OF THE AIR
CHAIN DOTTED LINES REPRESENT EXISTING MACHINERY, OR MACHINERY TENDERED FOR UNDER ANOTHER EQUIRY, OR MACHINERY TO BE SUPPLIED BY CLIENTS



FLOW DIAGRAM OF GRANULATING PLANT.

had their share of "teething troubles" in the design and operation of these plants, but the fact that over 70% of the mixed fertilizers sold in Britain today are made in the granular form, and the demand still exceeds the supply, proves the popularity of this type of material with our ultimate judge—the farmer.

Soil Research Needed In Humid South

In a look ahead at research needed to solve soil management problems in the humid South, Dr. R. Q. Parks, soil scientist of the U. S. Department of Agriculture, told Southern Agricultural Workers meeting at Biloxi, Miss., that the maintenance of fertility and better use of water are the chief concerns. Broad problems, which call for study, are:

(1) What are the favorable levels of available soil phosphorus for different crops and soils? Southern farmers apply an average of 3½ times as much phosphorus in fertilizers as is removed in crops. Dr. Parks said that if favorable levels were known it might be more economical to apply the phosphorus all at one time rather than in small amounts over a period of 25 to 125 years.

(2) The extent to which deep-rooted legumes such as sericea and kudzu can be used to improve the soils.

(3) The rates at which native potash is released and how this release can be modified by management practices.

(4) Much more information is needed on the availability of minor elements in soils and the effect of modern management practices on their release.

(5) The possibility of using a wide range of liming rates together with greatly increased applications of the minor elements, potash, magnesium, and phosphorus to increase and maintain soil fertility.

Turning to water conservation in soil management, Dr. Parks said in some areas southern farmers can do a great deal to supplement rainfall but those on far larger acreage must give attention to getting more efficient use of the rain that falls on the land.

It's

"The soil conservation program is basic to the future of our country" Kent Leavitt, president of the National Association of Soil Conservation Districts, told the third annual meeting of the Connecticut association recently. He speaks with national authority. And what he says is so closely parallel to what is said in the report we present herewith that what Emory University has found out about the Southeast, can well be applied to many sections nationally. From that standpoint, it is worth your reading whether you live in Maine or Texas or California.

In August, 1947, representatives of the Committee for Economic Development approached Emory University in regard to the desirability of inaugurating among business men of the Atlanta area an extra-curricular program to promote education on major economic problems confronting the Southeastern Region. Emory was receptive to this proposal, and in the fall of that year the University was given a grant-in-aid by the Carnegie Corporation to further the work. These funds were matched by the University.

The Business Executives' Research Committee built its study program in general around the basic problems of the cotton-and tobacco-raising Southeastern states. Particular attention and emphasis were directed toward farm questions as they relate to Georgia. This approach was natural inasmuch as the Committee members are residents of Georgia and therefore are most concerned with economic problems as they affect that state.

The present report is the result of the group's consideration of problems involved in restoring and maintaining farm land. The Committee believes that businessmen everywhere in the Southeast have a vital interest in the attainment of this goal. Simple approval of such an objective by the businessman is not enough; he must interest himself in and support the work farmers and conservation specialists are carrying on to combat erosion. Productivity of land has a dollars and cents importance to the prosperity of business and businessmen should appreciate the full impact of the truisms: poor farms mean poor business, and deserted farms mean no business.

The Committee hopes that its study will explain certain fundamental questions involved in effectuating the conservation program and that it will serve to stimulate greater interest on the part of businessmen in solving those problems.

The Business Executives' Research Committee began its study of problems of mutual interest to business and agriculture by considering questions relating to the rehabilitation of the land and the conservation of soil. This approach was basic because proper use and maintenance of the land is fundamental to an enduring and profitable agriculture.

Even though waste and misuse of farm lands have been common throughout the United States, Georgia and the rest of the tobacco and cotton-raising Southeast rank highest among the areas of the nation which have suffered most damage to land. A trip across the region impresses even a casual observer with the fact that we have not been good stewards of our greatest physical endowment, the soil. Erosion has been allowed to rob the area of thousands of acres, and in some sections fertility has been so depleted that entire farms have been abandoned.

The reasons for land abuse are deeply rooted in the past, and others as well as the farmer must share the blame. But no useful purpose will be served by dwelling upon the historical causes for the loss and misuse of land in seeking to blame any one group for the mistakes which have been made. Rather, it will be more fruitful to consider what is being done to arrest further losses and to study problems which lie in the way or rehabilitating and restoring damaged land in order that it may be conserved for the future and, at the same time, continue to furnish a permanent means of livelihood for the great numbers of people who must of necessity depend upon farming for a living.

Even as far back as the times of Washington and Jefferson, abuse of the land was a 'matter for alarm. Since that time thoughtful people interested in wise land-use methods have warned of the increasing seriousness of the South's soil conservation problems. It is in this generation, principally in the last decades, however, that a widespread, concerted effort is being made toward arresting erosion and rebuilding the land. For this reason there is much satisfaction in the fact that, according to the latest estimates of the United States Soil Conservation Service, some 25,415,-

our Land!

000 acres in the Southeast have received proper and adequate conservation treatment. This acreage, however, represents a relatively small part of the area which needs to be restored. Of the Southeast's 68,324,000 acres of cropland, 11,233,000 acres are so badly damaged or so rough that they should be turned to trees, grasses, or some other form of productive vegetation. Such acres improperly used and poorly treated do not pay and make the affected communties poorer. A total of 126,360,000 acres of cropland, pasture and woodland in the region need soil conservation effort to prevent further damage. Two-thirds of this acreage is sloping land which will sooner or later become unproductive as a result of erosion unless it is properly used and treated.

Organization for Land Rehabilitation and Soil Conservation

The above figures show that the South is far from winning the battle against the loss of its land. Despite increased interest and effort in the direction of conservation, more fertility still is being taken from the soil than is being put back, and eroding forces which actually remove soil from the fields are outstripping the work of the conservationists.

Nonetheless, the 25,400,000 acres that have been redeemed are of great significance because they show that after generations of careless use of land and squandering of soil, the dangerous trend has been reversed. The successful treatment of these lands clearly indicates that we have organized our efforts and developed the know-how for combating the forces of erosion.

The machinery set up to effectuate a conservation and rehabilitation program merits brief mention here in order that groups and agencies working to improve the land may be pointed out. The main task in conserving soil, water, and related

CONCLUSIONS ON LAND REHABILITATION AND SOIL CONSERVATION

The Business Executives' Research Committee believes that it is most important that we intensify efforts toward both soil conservation and the removal of obstacles which adversely affect the proper use of farm land. The entire nation should realize the magnitude of soil problems and should know that our existence depends on productive land. Businessmen are in a position to further this important work in these specific ways:

1. *Take steps to inform themselves at first hand of the questions of conservation and of the procedures and practices which wise farmers and experienced conservationists know will solve the problems.*

2. *Support conservation specialists in their work, and be especially careful not to give conflicting advice to a farmer who is following a specific program that has been planned for him and his farm.*

3. *Encourage farmers to continue their conservation programs if their interest begins to wane before conservation adjustments are completed.*

4. *Support research aimed at developing marketing methods and outlets for products flowing from a diversified agriculture, and support research for improving existing marketing channels and methods for the South's traditional products.*

5. *Study ways and means of making available to farmers intermediate loans for effectuating and restoration programs.*

6. *Encourage the development of satisfactory ways for land owners and tenants to divide their respective shares of the new commodities made possible by a diversified agriculture.*

7. *Encourage landowners to take the initiative in working out new types of mutual agreements which will develop more responsible tenants and which will hold tenants on the land for longer periods of time, and*

8. *Support every reasonable effort that looks to an improvement in the standard of living and well-being of the farm group.*

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resources falls upon the farmers, and to bring about a vital concerted effort in this respect, soil conservation districts at the local level have been organized in all parts of the country. Each has passed acts which permit farmers and land owners to farm independent political units to coordinate programs for soil and water conservation, drainage, erosion and flood control, and the adoption of wise land-use policies. These conservation districts are autonomous, but they receive technical aid from higher level State and Federal agencies. Among these organizations are the Agricultural Extension Services of the various states. It is their task to carry on direct educational activities in every county. In this work they encourage the farmer to greater effort at conservation, and especially they assist him in making those shifts in his farming practices that are necessary in the changing agricultural systems and operations which must go with a land-rehabilitation program.

The United States Soil Conservation Service of the Department of Agriculture is the leader among the agencies aiding and unifying the whole conservation program both locally and nationally. This organization gives technical assistance to the individual farmer or to the conservation and water control.

Other important Federal agencies concerned with conservation work in one way or another are the Farm Credit Administration, Forest Service, Farmers Home Administration, Federal Reserve Banks, and the Production and Marketing Administration. The last encourages farmers to carry on conservation by making payments to farmers for adopting designated conservation practices.

Governmental organizations are not the only agencies striving to effectuate land-conservation programs. Numbers of private groups also are endeavoring to encourage greater effort at land rehabilitation. Notable among these are the sponsors of the Callaway Plan, which originated in Georgia. Here and there Community Development groups are striving for soil betterment; and private organizations such as banks, railroads, farm implement manufacturers and dealers, and chemical concerns are aggressively working for land improvement. In numbers of important instances individual business and professional men who own farms have restored them in order to furnish models in their com-

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Contracts for thirty-four highly-efficient Sackett Plant Modernization Programs were awarded to us by thrifty, cost-conscious American Plant Food Manufacturers during 1949. Especially significant is the fact that **seven** of these were purchased by one of the oldest-established manufacturers in the business.

The advanced design and rugged construction of Sackett Systems and Processes are fast gaining favor with plant food manufacturers who demand **results.** If you are one of these, we invite you to let us counsel you on your own production problems.

*or were in the process of installing

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munities of what can be done in modern land rehabilitation operations.

The agencies playing the leadership role in conservation have a difficult and complex task ahead of them. Though energetic their efforts cannot lead to a quick correction of problems that have been generations in forming. As a matter of good citizenship and on the basis of self-interest, businessmen should become aware of the complexities involved in further land rehabilitation and the nature of the steps to be taken to meet them.

Businessmen who sincerely want to understand the implications of the conservation question should study the physical, economic, and social problems which affect conservation and inform themselves on the practices which professional conservationists are urging for the restoration of the land. In this connection civic clubs and professional groups might schedule talks on the diverse aspects of the subject for their meetings. The bigger the city in which such groups gather, the greater the potentials of this suggestion because people in large cities generally are less likely to be directly acquainted with farm problems than are those in smaller towns. Tours which offer an opportunity to study at first hand the effects of erosion and land misuse can be arranged to great advantage. It will be seen, for instance, that water which is vital to the farmer when it is controlled can become a destructive enemy when allowed to run uncontrolled. Inspection of neglected areas should be followed by visits to farms or farming sections where protective devices against erosion have been installed and where modern cropping practices have been planned and adopted. Such a trip would be a revelation to the intelligent businessman who has not already been concerned with conservation matters. He could not fail to return from such a tour without a sense of the seriousness of the task that lies ahead in conserving the land. Business groups wanting to make such visits would be certain to receive the hearty cooperation of conservation-minded farmers and governmental specialists in arranging and conducting such excursions.

Basic Factors Affecting Soil Neglect

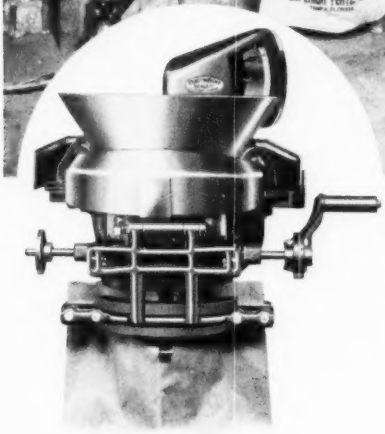
Businessmen should learn at first hand about the physical and operational aspects of conservation problems, but their understanding of the basic questions involved will not be complete without a knowledge of the underlying factors which encourage land depletion and neglect. Through experiments and practice technical specialists in conservation have developed the know-how for combatting erosion and land abuse in the physical sense. The greatest problems they now have to solve are locked up in these underlying factors, and businessmen can be most helpful in furthering conservation work by comprehending and assisting in solving these problems.

Of the many factors affecting land misuse a few are of fundamental importance, and an adjustment of these basic factors will pave the way for a relatively easy solution of the lesser related questions.

One item of fundamental importance which the businessman should know about the conservation problem as it relates to Georgia and the Southeast is that crop lands of the area in the main are not as fertile as the average farm lands in the United States. In some parts of

(Continued on page 48)

A smooth running installation of EXACT WEIGHT Sacking Scales in the Superior Fertilizer Company plant, Tampa, Florida.



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Packaging costs are cut by (1) good layout designed to fit the product (2) accuracy, or how much is in the bag, plus or minus (3) speed of operation whether the operation be semi-automatic or hand check-weighing (4) durability of equipment, which is important from the standpoint of mounting labor costs due to equipment failure. All of these cost cutting factors have entered into EXACT WEIGHT Sacking Scales engineering and manufacture for years . . . have made these famous scales preferred equipment in many bagging operations nationally. For accurate weights and uniform bags settle one equipment problem by writing for details on EXACT WEIGHT Sacking Scales to fit your job.

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Pringle PROFITS FROM

By R. P. Wiggers

The A. F. Pringle & Co., Inc. of Charleston, S. C. has developed a modern new production system in its manufacture of Merco brand fertilizer. This system directly combats the drastic reduction in profit margins which have become increasingly serious in the fertilizer industry in recent years. It has already saved thousands of dollars by presenting an effective counter-balance to the high labor costs which are at the root of the present situation. It is based on the assumption that **materials handling** deserves major attention in the company's overall production plans.

In proceeding to modernize its own plants this company conducted a thorough analysis of its operations—found that the greatest wastes and inefficiencies in the entire manufacturing process lay in the movement of materials from their arrival at the plant to their shipment as finished products. Antiquated methods of unloading materials from box cars moving them to storage and handling them through the various departments resulted in almost unbelievable delays, duplications and uncoordinated efforts. The company's dependency upon manual operations was the main cause for the terrifically high cost per ton of materials handled. This cost greatly affected overall production costs. Obviously a renovation of materials handling system was in order.

The new Pringle material handling system which resulted from the analysis presents a startling contrast with the old in that a fleet of modern Hough Payloaders is now used exclusively to unload, convey, store and feed the many bulk materials throughout most all plant operations. Hand shovels and fertilizer carts are now discarded relics! These are unique heavy-duty front-end loaders whose unusually rugged, single-unit construction and fast speeds in both directions make them particularly adaptable to withstand the rigorous treatment involved in the digging and handling of dense fertilizer materials. For example, they perform every type of fertilizer handling without the assistance of hand shoveling. They unload such raw materials as phosphates, limestone, potash, fish, tankage, sulphate ammonia etc. directly from box cars and load them into storage bins. They transport sulphur from outdoor stockpiles to acid processing vats. Indoors they feed the mixing machines with the proper mixtures of ingredients, they dig finished fertilizers out of the curing areas and carry them directly to the bagging machines. It requires one of these machines only a matter of seconds to cut into the dense piles, hydraulically obtain a 12 cubic foot or 900 lb. load, transport it an average of 150 feet to a bagging machine, dump the load and return for another.

J. H. Wragge, Plant Superintendent points out that time and cost-saving results from the new system are many and varied. For example, under the old system it formerly required four men four hours to unload a 50-ton car of materials by means of shovels and carts. One man and a bulk loader now perform the job alone. In some cases a Hough Machine will unload a box car in **two** hours. In cases such as these one man unloads 100 tons in half a day as compared with four men doing the same amount of work in eight hours in the past. In some instances a man on a leader does work equivalent to 10 other men with shovels and carts. Whereas car unloading costs before averaged 35 cents per ton they have now been reduced to five cents per ton—an 85% reduction!

Another example of new daily savings is exemplified in stockpile work between the storage areas and the production machines. In one plant building there are three of those areas and the cost reduction made therein is broken down as follows: In each area it formerly required two men to load materials into carts and two men to

MODERN MATERIALS HANDLING SYSTEM

1. A Model HA Hough Payloader engaged in unloading a 50-ton box car of limestone. The operation requires 2 hours.
2. Limestone is unloaded into the storage bin.
3. Another Payloader digs into dense stockpile of superphosphate. Load is obtained hydraulically.
4. After "weighing-in" the superphosphate is deposited in a Sturtevant 2-ton Basing Machine.

In Plant #2 finished fertilizer is removed by Payloader from the curing area, fertilizer is dumped into an elevator grate of a bagging machine, and many other uses keep this versatile machine busy.

roll them—a total of four men. One loader now does **all** the work faster. In other words, three men now do the work of twelve with less effort fatigue and under much better conditions.

The A. F. Pringle & Co., Inc. which handles and processes an average of 125,000 tons of materials per year likewise points out that the acquisition of the material handling machines has meant more than reduced operational costs—it has **actually increased the production capacity of the plant.** The increased speed with which materials can be fed to the mixing and bagging machines plus the corresponding decrease in congestion in the feeding area warranted the replacement of a 1-ton mill with a mill of 2-ton capacity. It was discovered that it cost no more to charge the large mill than it did the small mill. Pringle officials state that "regardless of the size of the labor force utilized the 2-ton mill would be impractical were it not for the labor saving bulk loaders."

Like any good materials handling system the Pringle method has been soundly engineered to meet the specific conditions imposed by the physical layout of the various plant buildings and yard areas. Plant layout has been arranged in such a manner as to avoid long hauls wherever possible between operations. Two hundred feet is the average haul, 500 feet the longest. Fundamental objectives have been to move the largest amount of materials as quickly as possible with the greatest economy of time, men and expense in such a manner as to create a smooth and uniform flow of materials at all time in perfect safety to the workers. To accomplish this it has been necessary to practically eliminiate the former standard manual shoveling and pushing operations. It was necessary that the new mechanized system meet certain predetermined specifications. The material handling equipment had to fulfill the vigorous demands of a 90 to 120 day peak production period common to the industry—it had to be rugged, dependable and capable of constant maximum production involving 24-hour per day schedules upon demand. The ability to operate indoors and outdoors—simplicity of operation—over varying floor, road and weather conditions—its service accessibility—all were vital requisites in the planning program.

That the new system is successful is obvious from the words of C. L. Paul, Production Manager, who says "our capital outlay in Hough Payloaders now approximates our investment in production machinery but the results we are getting show that our expenditures for this equipment has been quickly repaid in reduced production costs."

The A. F. Pringle & Co., Inc. is particularly proud of the increased safety and the greatly improved working conditions gained for its men. The mechanization program has developed better jobs for the men who, formerly performed entirely manual operations. "It has been a real source of satisfaction to us" states Mr. Paul, "to greatly reduce the fatigue and unpleasantness which was formerly common among our workers. Our new system has contributed considerably to the happiness and well being of our people."

U. S. Stoneware Offers Protecto-Grid

An expanded piece of metal, completely covered with a tough, resilient material known as Tygoflex, becomes the Protecto-Grid, offered by U. S. Stoneware Co., Akron, Ohio. It forms a cushion for sink or drainboard and is resistant to acids and alkalies. It is offered in sizes to fit virtually any sink or drainboard.

Tygon, used in the Protecto-Grid, is the subject of a bulletin which gives full data on the formulations of Tygon plastic tubing, its uses, properties and chemical resistance characteristics. The bulletin is listed as T-77, and a copy may be had by writing U. S. Stoneware Co., P. O. Box 350, Akron 9, Ohio.

Salvage Plan for Multiwall Bags

In order to simplify the salvage of used multiwall paper bags, the Paper Shipping Sack Manufacturers Association have approved a program for marking a standard symbol on all such bags suitable for repulping. The symbol ANK will be imprinted on such bags, and waste dealers are expected to bid for the salvage rights to bags so marked. The waste paper dealer association has approved the plan, in fact has urged it for some time as a conservation measure.

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Increase the plant-food content of your superphosphates.

Cut curing time by neutralizing excess acid.

Improve storing and drilling characteristics.

Greatly reduce rotting of fertilizer bags.

Get the cheapest form of nitrogen—anhydrous ammonia.

Over 1000 tons of anhydrous ammonia are being produced each week at CSC's Dixie Plant at Sterlington, La. CSC is working at top capacity to supply this raw material to the fertilizer industry. The major part of this around-the-clock production is being converted into fertilizer by Gulf Coast manufacturers.

CSC

AGRICULTURAL DIVISION • COMMERCIAL SOLVENTS CORPORATION • 17 EAST 42nd STREET, NEW YORK 17, N. Y.

Mostly Personal

Monsanto's phosphate division Anniston, Alabama, has a new associate director and three assistant directors. The associate is **Charles B. Durgin**, who has been with the Anniston operation since it was Swann Chemical, in 1922. Assistants are: **Henry V. Moss**, research supervisor since 1945; **Edgar E. Hardy**, also a research supervisor since 1945; **Christian H. Aall**, who has been a group leader and was consultant to Monsanto before he joined them in 1947. Dr. Aall will continue to live at Columbia, Tennessee.

* * *

Wayne D. Staley, former New York district manager for **The Duriron Company** has been made general sales manager and will be at the home office in Dayton, Ohio. **R. F. Sharpe** has replaced Mr. Staley in the New York post, and the Philadelphia vacancy thus created will be filled by **Ralph L. Watts.**

* * *

Sinclair B. McCoy, for five years general traffic manager for International M & C has been made assistant to **A. Norman Into**, potash division vice-president. **James L. Taylor**, for two years chief engineer of the potash mine and refinery at Carlsbad, New Mexico has been made construction engineer for the entire corporation.

* * *

W. D. McLean, assistant burlap department director of Bemis Bro. Bag Co., Boston, flew recently to Calcutta where he will get a first-hand picture of the confused jute and burlap situation, which has been fully reported here in previous issues.

* * *

E. Bradford Hollingsworth and **Paul H. Fretthold** went to work for **National Gypsum**, Buffalo, New York, on the same day, 14 years ago. Recently both were named to executive posts: Mr. Hollingworth to be production manager in charge of six plants; Mr. Fretthold, production control manager.

* * *

Ralph Hunter, of **Dow Chemical** was presented with an honorary degree, doctor of engineering by the Case Institute at their mid-term 1950 commencement—"in recognition of industrial achievement and of technical service to the government."

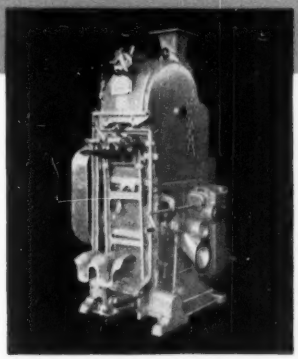
* * *

N. K. Totman, Treasurer of **Summers Fertilizer Company**, and **Doris Zaiser**, Secretary were honored February 25 at a dinner celebrating their completion of 25 years of service with the company. **James E. Totman**, President, presented suitable mementoes. N. K. Totman is president of the Baltimore Kiwanis Club.

R. E. Jury, who has been with Arkell and Smiths since 1947, has been elevated from Division Manager in the west to Western Sales Manager.

The Board of Directors of Arkell and Smiths has announced the election of Sheldon Y. Carnes to Vice President and a member of the Board of Directors.

can speed up your packaging... cut your man-hour cost per ton



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ARKANSAS

Arkansas Farmers Fertilizer Plant was opened formally February 6 in Little Rock. It cost $400,000 which was raised among farmers of the area, as we have reported throughout the progress of the operation. The officials are: Board President, **Ralph Hudson;** Board Chairman, **Joe Hardin;** Directors, **Joe S. Reed, Walter E. May, Jr., Elmer T. Miller, Raymond Frey, Harry Goforth, Dana Reynolds, C. W. Sheldon.** Executive Manager is **Clifford L. Smith;** General Manager, **M. D. Broadfield;** Manager of procurement and sales, **Gilbert M. Measele.**

* * *

Waldro Fertilizer Works, Magnolia, has built a new 70 x 72 foot building which gives them an increase in daily output to better than 150 tons. The new construction, under way for the past four months cost $10,000. The plant has an annual payroll of $30,000 and employs 25 men.

* * *

R & S Liquid Fertilizer Co., Forrest City, has announced two plants for St. Francis County for anhydrous ammonia service.

CALIFORNIA

Pomona Fertilizer Co., Inc., Pomona. We had a letter from **Edward F. Struve,** secretary-manager, along with a subscription check, in which he said he'd like to meet the man who is shown smoking his pipe (Editor Bruce Moran at the head of the "It Seems to Me" column) "He looks like he is comfortable and does not do any worrying over trifles," wrote Ed. But the real story is in the letter which followed, and a subsequent letter. They are in the California citrus belt, and for a long time the growers felt they needed nothing but nitrogen. As the idea developed that a balanced plant food was needed, the higher cost became a problem and Mr. Struve conceived the idea of a semi-cooperative concern, which was formed in 1936. The idea was that for every $10 share of stock owned the farmer could buy one ton of mixed fertilizer a year at cost—that is the cost of materials plus overhead.

They are not, however, under the cooperative code but a California corporation which can sell to anyone and lay up a surplus. This they have done to the extent of three quarters of their capital stock. "This comes in mighty handy this year" says Mr. Struve **"when everyone seems to have gone crazy and thinks they must have business even if they lose money in the selling.** We know very well we will have some red ink this year but fortunately are very well cushioned.

Planning originally to work only in a limited area, the bad recent season made them go further from home for business. The potato farmers began using mixed goods a couple of years ago and the results were so good they are all using them this year, with exceptional yields—425 bags to the acre, and some had over 90% of number ones. **"Even though they have been helped by the subsidies, they are not in favor of them, for they believe this will eventually take most of their freedom away from them."**

He liked the editorial in January, about buying fertilizer now, and his friend Dick Nixon, whom he hopes will be the next Senator from California, is using it in all his speeches.

That's what Ed wrote about, and we are very grateful to him for writing, and wish more of you would do the same.

COLORADO

Colorado Plant Food Co., Manzanola, has just moved there from Rocky Ford. They have a mixing unit with a 30-40 daily ton capacity, and their opening was celebrated with due ceremony.

FLORIDA

The idea of deeding mined out phosphate land, which we reported some months back from Florida has developed. In Lakeland seven major phosphate firms have been asked by the Polk County children's committee to make such land available for long range improvement. These are: **International M & M, American Cyanamid, AAC, Davison, V-C and Coronet.**

GEORGIA

Wrightsville citizens recently were seized with a fit of sneezing, as a smoldering fire from 2200 tons of fertilizer gave off a gas, and firemen were afraid to put water on it. Our informant failed to mention the name of the plant, but **Commercial Fertilizer Year Book** lists **Lovett & Company** as the only plant in Wrightsville, so we guess it must have been their fire.

* * *

Quitman Liquid Fertilizer Co., Quitman, has been established to distribute anhydrous ammonia in the vicinity by the Mathis Brothers, who have had a lime spreading service.

MISSISSIPPI

Mississippi Chemical Corp., Yazoo City, has secured approval of a $3,349,000 loan by RFC. **Owen Cooper,** executive vice-president has reported. It is for a 7 year period at 4 percent interest, and contingent on the corporation putting up $4,750,000 of its own. $4,250,000 of this is already in hand.

* * *

Greenville Liquid Fertilizer Co., Greenville, has established two anhydrous ammonia plants in that vicinity.

* * *

Mid-South Chemical Co., Memphis, Tennessee, has established a $30,000 anhydrous ammonia storage plant at Pontotoc. E. S. Tierney will be distributor for that area.

MISSOURI

MFA Coop Association, California, has installed equipment for handling bulk raw phosphate in carlots. **Ray T. Ehlert** is manager.

NEBRASKA

Sure-Crop Chemical Co., Gering, are establishing a mixing plant, according to word from **Art Couch.**

NORTH CAROLINA

Smoky Mountain Fertilizer Co., Waynesville, is expecting to complete its $100,000 plant in time for Spring planting. The plant is 80 by 160 feet, two stories high. The incorporators were **G. C. Thompson, Mrs. Thompson and W. L. Harwell.**

Mr. Thompson was for 20 years with **International Minerals & Chemical** and for four years with **Louisville Fertilizer.** Mr. Harwell is with **Carbide & Carbon Chemical,** Oak Ridge, where he will continue.

OKLAHOMA

Thurston Chemical Co., Joplin, Missouri, are reported seeking test plots in Oklahoma areas as a demonstration of proper fertilizer programs.

SOUTH CAROLINA

The Southern Cotton Oil Co., plant at Florence has been fully modernized and rebuilt so that it now produces more than 45 tons of mixed fertilizer per hour, with from 10 to 12 men. Before modernization 40 men made only 10 tons per hour.

* * *

Rentz and Felder plant, Bamberg, has been leased by **H. L. Free** who will operate it. The plant was part of the estate of **B. T. Felder** who owned and operated it after the retirement of **C. W. Rentz.**

TENNESSEE

Liquid Fertilizer & Chemical Co. Inc., Jackson, have established anhydrous ammonia branches at several Tennessee points: Huntingdon, and McKenzie. **The Carroll County Fertilizer Co.:** Newbern, the **Tigrett Fertilizer Co.:** Selmer, the **Selmer Liquid Fertilizer Co.**

TEXAS

Dow Chemical's anhydrous ammonia plant at Freeport will be built by the **Austin Company.** The plant, reported here in January, will cost $5,000,000 and will produce 100 tons daily.

* * *

Dailey's Milk Plant, Port Arthur, has been granted a charter, for 50-year term, with $40,000 capital. Incorporators: **Henry A. Dailey, Margaret Dailey** and **Carl Vaughan.** Feeds and Fertilizers.

* * *

Farmbilt Mills, Inc., Cuero, has been granted a charter, for 50-year term, with $21,000 capital. Incorporators: **A. W. Schaffner, P. G. Schaffner** and **Leon T. Kruse.** Feeds & Fertilizers.

* * *

Pest Fog, Inc., Corpus Christi, has been granted a charter, for 50-year term, with $3,000 capital. Incorporators: **William I. Cchen, Jonas Weil** and **Cecelia W. Cohen.** Feeds & Fertilizers.

* * *

Red Stag Leaf Mold Co., Bishop, has been granted a charter, for 50-year term, with $50,000 capital. Incorporators: **Burney Parker, Harry Henderson** and **T. E. Richards.** Feeds & Fertilizers.

AUSTRALIA

Electrolytic Zinc Co., has begun its plant at Risdon, Tasmania, originally reported at $5,625,000 but now expected to cost much more. It will be capable of 50,000 annual tons of ammonium sulphate.

INDIA

Monsanto Chemicals of India, Bombay, has been established to handle in India all Monsanto activities in that country. An adequate selling organization will be set up, and eventual production is contemplated.

PUERTO RICO

Ochoa Fertilizer Corp., Hato Rey, recently opened a new plant.

OBITUARIES

Mrs. Ruth Dow Doan, 54, wife of Leland I. Doan, president of Dow Chemical, January 21 in a New York hotel, of a heart attack. Her brother was Dr. Willard H. Dow, former Dow president who was killed in a plane crash in March.

Spencer Franklin Elwood, 55, president of Farmers Fertilizer Co., Columbus, Ohio, and NFA director, suddenly in his office, January 18.

Leo B. Marx, 60, superintendent of the Trueman Fertilizer Company, Jacksonville, Florida, February 5, after a long illness.

Edward Nobles, 71, president of the Growers Fertilizer Co., Fort Pierce, Florida, February 8 after an extended illness.

J. Russell Porter, 69, retired Southeastern manager American Potash and Chemical Co., and founder of the Porter Fertilizer Works, February 23, in Atlanta, Georgia.

John T. Stevens, 80, president of Catawba Fertilizer Co., Kershaw, South Carolina, at his home, January 19.

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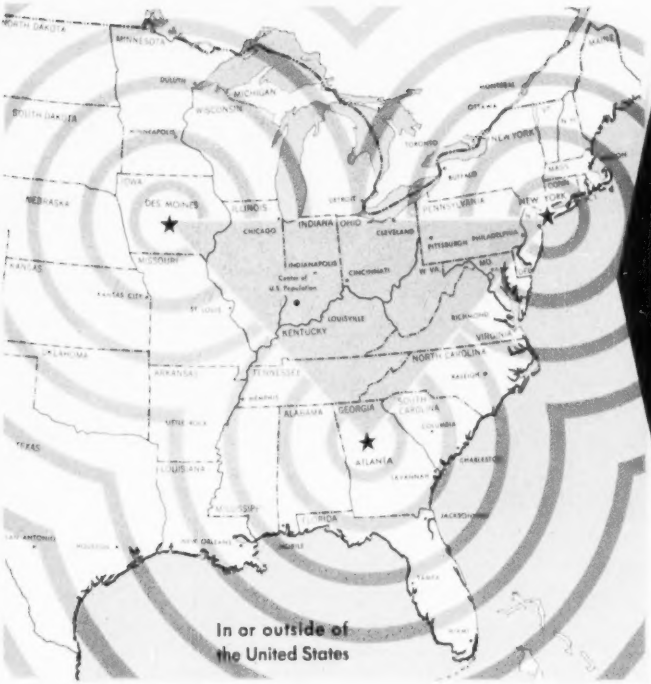

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Fertilizer pays

By William B. Brown

A recent Los Angeles County Agricultural Extension study of the cost of celery production among eight growers working a total of 349 acres in three Southern California counties ended with the conclusion that growers, using commercial fertilizer predominately, out-produced these using natural fertilizer with a substantial saving in cost.

The survey shows that growers using the organic material lost as much as 37 cents per crate on celery marketed in 1948.

Scanning a chart prepared by the association, though the cost and laying commercial fertilizer was enough to make noted difference in profit and loss, the type of fertilizer used was the much more important factor. For example, one grower using 1100 pounds of Nitrogen per acre harvested only 804 crates of celery. Another grower using only 532 pounds of Nitrogen produced 1154 crates.

How this happened leaves but one conclusion: the grower who used the larger amount of Nitrogen utilized too much organic material and too little commercial fertilizer.

The facts contained in the chart, are these. The grower, number seven, followed this program.

Chicken manure
19,637 pounds per acre
Dairy manure
29,455 pounds per acre
8-8-4 Commercial Fertilizer
2,000 pounds per acre
NH_3, Ammonia in Irrigation
300 pounds per acre

Comparing this with grower number two (see chart) who used:

Chicken manure
5,000 pounds per acre.
10-5-5 Commercial
615 pounds per acre.
Calcium cyanamid
700 pounds per acre.
Ammonium nitrate
100 pounds per acre

The latter program brought in a yield of almost 50% more crates of celery per acre than grower number seven obtained. Including the cost of application, grower number seven, using mainly organic material, paid $242.68 per acre for it. Grower number two, meanwhile, using less than half the total amount of fertilizer but in more easily available commercial form with high nitrogen content paid only $211.45.

The cases studied are the extremes brought out by the Extension experiments. They illustrate vividly, however, the facts and plain advantages to be gained with the use of commercial fertilizer over natural organic materials. Another example:

Grower number six in the chart fertilized each acre with:

Chicken manure
36,364 pound
Dairy manure
100,000 pounds

His total amount of nitrogen per acre was 1609 pounds. His cost of material and application was very close to the highest in the group—$260.62 per acre. On the other hand, grower number three used:

Chicken manure
6,000 pounds
Dairy manure
20,000 pounds
10-5-5 Commercial
3,000 pounds
Calcium Cyanamid
150 pounds
Ammonium nitrate
250 pounds

His applied fertilizer cost was $172.46 per acre, and resulted in an increase of 97 crates of celery per acre over grower number six.

One more outstanding feature of the survey shows grower number five using the largest amount of one single type of commercial fertilizer. His choice of 8-8-4 however was unwise. Celery being a leafy crop needed a higher nitrogen carrying formula.

the Celery grower

Altogether the 8,000 pounds of chicken manure gave grower number five, with his high of 5700 pounds of commercial fertilizer, only 667 pounds of nitrogen. This must have shown a deficiency during the growth of the crop in the field. Additional use of NH3 seemingly was used almost as an afterthought.

The cost of the various fertilizer programs for celery harvested per crate was as follows:

Grower No.	Yield in Crates	Cost of Fertilizer	Cost per crate
1	1,154	$211.55	$.1823
2	1,106	$132.45	$.1286
3	1,097	$172.46	$.1665
4	1,027	$264.28	$.2573
5	1,000	$418.38	$.4184
6	1,000	$260.62	$.2606
7	804	$242.68	$.3018
8	725	$145.76	$.2015

A quick glimpse and it is interesting to note that grower number two, with a preponderance of chicken manure plus 8-8-4 gained the lowest cost per crate. However above him on the chart it is shown that grower number one, using more commercial fertilizer in proportion to straight organic material, obtained the highest yield.

Also an important conclusion is brought out in comparing number two and six. In this bracket, it is shown that a heavy organic fertilization plus 8-8-4 resulted in a harvest of 106 more crates per acre than did fertilization with organic materials exclusively.

The two growers who used 10-10-5 plus other high nitrogen commercial fertilizers were among the three highest and most economical producers.

Four hundred pounds of nitrogen per acre is necessary for a good yield and high quality, according to H. W. Schwalm in charge of Los Angeles County Agricultural Extension survey. An increase in yield can be obtained with 600 pounds. Beyond that, the law of diminishing returns begins to operate.

Since Nitrogen can be obtained from many sources, however, this study shows that high nitrogen commercial fertilizers helped produce the largest and most economical celery crops. The averages of both types of fertilization were lowered considerably when dependence was placed upon heavy applications of organic manures.

CELERY YIELD AND FERTILIZER COSTS ON EIGHT SOUTHERN CALIFORNIA FARMS

Farm Number	Yield per acre (crates)	Fertilizer Kind	Fertilizer Pounds per acre	Pounds Nitrogen per acre	Cost of Fertilizer	Cost of Labor	Total Costs Labor and Material
1	1,154	Chicken 10-5-5 Col. cyanamid Amm. nitrate	5000 4615 700 100	532	$199.86	$11.69	$211.55
2	1,106	Chicken 8-8-4	28500 1176	807	128.99	3.46	132.45
3	1,097	Chicken Dairy 10-5-5 Amm. nitrate Col. cyanamid	6000 20000 3000 250 150	762	153.75	18.71	172.46
4	1,027	Chicken 8-8-4 16-20	29429 4000 1200	1056	236.57	27.71	264.28
5	1,000	Chicken 8-8-4 NH	8000 5700 13	667	414.10	4.28	418.38
6	1,000	Chicken Dairy	36364 100000	1609	260.62	included in material	260.62
7	804	Chicken Dairy 8-8-4 NH	19637 29455 2000 300	1100	217.00	25.68	242.68
8	725	8-8-4 Amm. nitrate	500	498	135.00	10.76	145.75
Avg.	978			879	187.90	12.76	200.66

OUR LAND

(Continued from page 34)

the region, of course, are sections renowned for their productiveness, but in general, southeastern and Georgia soils are less fertile than are those of other sections. They have suffered more severely through loss of topsoil. Croplands in this area have been subjected to almost year-round weathering. The result has been not only physical wear on the land itself but a sustained reduction in plant food content in the soil. In this sense the region has been a victim of its beneficient climate and bountiful rainfall. Other sections with a more severe climate have suffered less in these respects because their soils have been blanketed with snow or locked in place by freezing during the winter months.

Another fundamental fact about the problem of conservation which the businessman should know is that there is a relatively heavy population pressure on the farm lands of Georgia and the Southeast as compared to the United States as a whole. The total acreage of farm land per farm person in Georgia, for instance, is only a little more than half the acreage of farm land per farm person for the country as a whole. This pressure of population on the land reflects itself in the tilling of lands not suited to commercial row crops. It also emphasizes the fact that Georgia, with her smaller amount of farm land per person, can ill afford the lowered production which goes with a worn and impoverished soil. Actually we have an abundance of land for farming, if we recognize its capabilities and its limitations and adjust farming operations accordingly. And on the other hand an unduly heavy population on farms means abundant human resources that are not being properly used because of an imbalance in the general regional economy, with too much effort being exerted in primary production fields like agriculture and not enough in secondary occupations such as manufacturing. One of the great tasks of the country and especially of southern leaders is to assist in channeling a considerable part of this heavy farm population into more productive fields.

In addition to these factors which have a bearing upon a wiser and better use of the land there are other social and economic factors which have an impact on farming and affect the use of land.

Farm life has suffered from too many disadvantages compared to town life. Farmers who are not content with their lot or with the returns from their farming efforts tend to be neglectful of their lands. This condition too frequently has led them to discount the future at a high rate for a small but certain gain in the present. Stated in another way, they have tended to mine their soil while they could and let the future with its uncertainties take care of itself. It is reasonable to believe that such an incentive to misuse the land would be removed if farming and farm life were made more attractive. Progress has been made in this direction in recent decades—for example, better roads and rural electrification—but much remains to be done. The farm group as a whole needs greater educational opportunities and a better social life. Home conveniences in the country generally are far short of those to be found in urban areas, even in small towns. Farm buildings often are inadequate and too frequently in poor repair. Even in these

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. . . could work an incredible revolution. For it would make an almost unbelievable difference in its ability to fertilize some fruits and grains.

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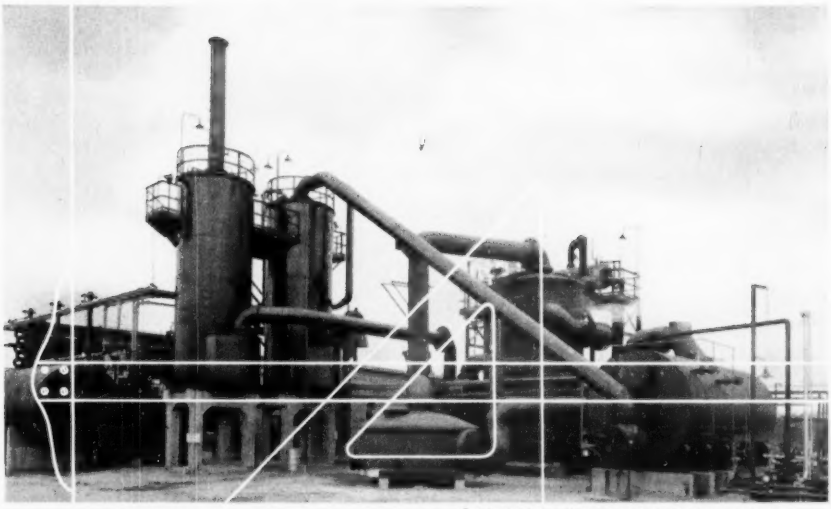

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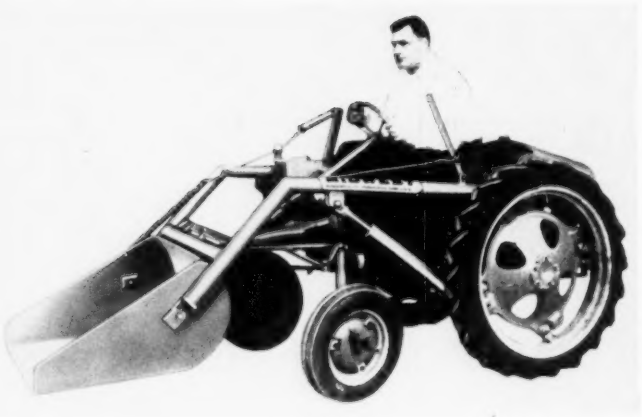


The Maquoketa Loader, hydraulically operated and controlled, with a 63" turning radius. Bucket can be raised, lowered or tripped from any position. An economical material mover that fills a need for light duty. Made by Maquoketa Company, Maquoketa, Iowa.

flush times most farmers do not have enough modern equipment and power machinery to ease the hard work of farming. Here we have the paradox of many farmers living in a power age still pursuing their occupation in a way that requires a high degree of hand labor and animal power. Little wonder that the farmer's productive capacity is relatively low compared to other fields of endeavor.

Nonetheless, the farm prosperity of the present period is giving many farmers a chance to break out of this situation. The familiar movement of labor from farm to industrial centers has been accelerated by the war and the post-war boom. This tendency has lessened population pressure on the land, and prosperous times have enabled more farmers to buy powered farm machinery. Along with these developments goes a greater opportunity to intensify the agricultural diversification which farm leaders have been so wisely advocating. The State and Federal specialists who advise the farmer on production problems see the opportunities in this situation and they are using it to advantage by seeking to discourage the farmer from producing crops that cannot be raised profitably on his farm and by encouraging him to plant crops better suited to his lands and equipment. Success of these efforts will create a greater and greater need for new marketing facilities and techniques with their complicated ramifications of grading, selling, storing, financing, tranporting, and processing. These requirements are primarily business functions and a successful development of them to fit the needs of the farmer is a challange to the businessman to do his part in furthering a successful readjustment of agriculture and an expansion of the variety of its products. There are rewards for both business and agriculture in these shifts and developments, but the point to be remembered here is that they will not fully materialize unless the land is rehabilitated and protected.

Another factor affecting land conservation is that no source of intermediate credit is generally available to farmers for strictly conservative practices, either from government-sponsored credit institutions or from commercial banks. There is increasing need of farm credit for such purposes to be repaid in periods of two to five years. Commercial banks, being institutions of deposit, necessarily maintain a considerable portion of their funds in highly liquid assets. It is the policy of most of them, therefore, to look unfavorably upon applications for loans extending over a period of years. Some banks do make such loans, but it is the custom in such instances to make the loan for a year with the understanding that if a reasonable portion of the loan is repaid the balance can be renewed. In the case of a loan for conservation, this periodic renewal feature is a distinct drawback inasmuch as the farmer is legally liable for the amount of the loan at the end of the year. But this period of time is much too short for the farmer to complete his land rehabilitation program. Most of the recommendations by extension and conservation specialists require adjustments that extend over a period of two to five years. The perennials, grazing crops, permanent pastures, ter-

racing, fencing and other practices involved in a well-planned farming program require the expenditure of capital which normally cannot be repaid in a year's time. In many instances the cost of inaugurating some practices, particularly the planting of perennial legumes may require an investment of from $35 to $45 an acre on land which may have cost only $20 to $30 an acre. Obviously few farmers can afford such expenditures from current revenues; they have to make a living from their farms at the same time that they are seeking to improve them. The type of loan required is more in the nature of capital investment than operating capital. The commercial banker, therefore, no matter what his personal willingness to encourage and support land rehabilitation, is placed in a peculiar position when approached for loans of the type required. He is limited by custom in the time for which he can make such advances, and even then in the event of a default he has no way or reclaiming his investment other than for the farm to continue in operation. Production credit associations, whose limitations are not so finely drawn as are those of commercial banks, are helping the farmer in a limited fashion in this field, but the restrictions on these credit agencies prevent them from meeting the need entirely. On the financial side there is a gap in the general conservation program that must be spanned if protection and rehabilitation of the land is to progress as rapidly as it should.

The earnest attention of agricultural economists and the banking fraternity should be directed toward this matter. The problem involved is not insurmountable. It represents a new type of credit need which is being inadequately met through lack of proper technique. In addition to his conventional restrictions, the banker is limited by an inadequate knowledge of the cost of conservation programs. If he had more data in this respect he could calculate more accurately the risks involved in such loans. If technical specialists in conservation would develop more precise information in this field for the use of lending agencies, they would have taken a long step toward opening up new sources of funds for land rehabilitation purposes.

A new bottom hopper dump trailer, produced by Gramm Trailer Corp, Delphos, Ohio. It loads through manhole openings that are weatherproof when closed, and is designed for weatherproof bulk handling of granular and powdered materials.

Another basic factor related to soil neglect and misuse in the Southeast arises from the land tenure system under which much of the region's farming is carried on. In the South in 1945 some 40 per cent of all farm operators were tenants. In Georgia the percentage was even higher, with 53.8 per cent of the farm operators having a tenancy status. Today, because of the pronounced drift of rural workers to industrial jobs or because of a change to ownership status, the proportion of farms operated by tenants has fallen to the lowest point in 50 years. This trend is wholesome, but it does not mean that the tenure question is on the way to solving itself. The percentage of persons who do not own the land they operate is still high.

There is nothing wrong with the idea of tenancy, and there should be no stigma attached to the tenancy status. The problem as far as land conservation goes is not in abolishing tenancy itself, but in ridding the system of the drawbacks that are associated with it. In many places, both in the United States and abroad, there are tenant arrangements that operate to the advantage of both land owners and tenants. These agreements demonstrate that it is possible to work out equitable bases for the use of farm land by non-owner operators.

There are a number of undesirable aspects to tenancy as it is now practiced. The chief of these drawbacks arises from

(Continued on page 38)

In the Field of

FARM CHEMICALS

Insecticides Held Essential To Adequate Food Supply

"There is no substantial evidence that any adverse effect on public health has resulted, in spite of the fact that nearly one billion pounds of insecticides are used annually in this country," the United States Department of Agriculture's leading witness, Dr. Fred C. Bishopp, assistant chief of the Bureau of Entomology and Plant Quarantine, said during the opening session of the Residue Tolerance Hearings.

Farm Flyers Meet In Texas

Agricultural aviators — fliers who are engaged in such activities as applying insecticides and defoliants, sowing legumes, seeding range lands, etc.—winged their way from all parts of the country for the National Agricultural Aviation Conference at Fort Worth, Texas, this month.

Approximately 300 persons interested in the agricultural phase of aviation, were expected for the meeting, March 7-8. These included farmers, as well as representatives of the U. S. Department of Agriculture, Civil Aeronautics Administration, National Agricultural Chemicals Association, land grant colleges and agricultural aviation companies.

Objective of the meeting is to make available to the persons using planes in agriculture, information which will help them in better servicing their customers. Latest findings in aviation agricultural research were to be discussed by experts from the government, educational agencies, trade associations and private companies.

V-C Subsidiary Builds Insecticide Plant

Production of insecticides is expected to start April 1 at the new plant under construction at Montgomery, Alabama for the Tobacco By-Products and Chemical Corp., Richmond, Virginia. The plant is being erected on V-C property, adjacent to the V-C plant there.

Geigy Builds Orlando Insecticide Plant

A plant with the capacity to produce half a million dollars worth of insecticides a year was opened in Orlando, Florida, last month by Geigy Co., Inc., New York. It covers 10,000 square feet. Charles L. Remington, with the company for a number of years, is manager.

N.A.C. URGES IMMEDIATE CONTROL CHEMICAL PURCHASES

National Agricultural Chemicals Association has issued a warning that infestations of three major pests—the boll weevil, European corn borer and the grasshopper—are expected to create heavy demand for insecticides, and recommend that farmers and growers anticipate their needs at once.

Monsanto Offers Ten Bulletins

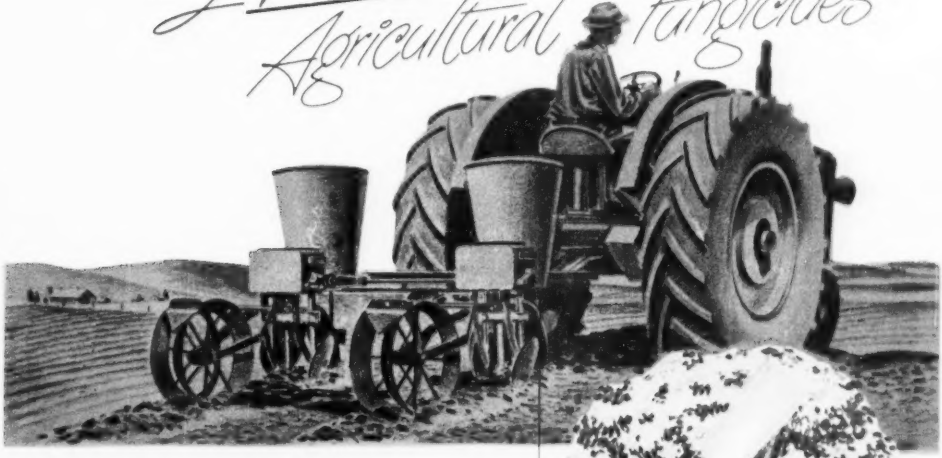
Ten typical formulations of insecticide, fungicide and herbicide emulsifiable concentrates are given in a technical bulletin available from Monsanto Chemical Company, St. Louis.

The 12-page bulletin is designed to give information about four new Monsanto emulsifiers and their uses, but also includes data on solvents and other ingredients. Procedures and equipment for the formulations are described as well.

DuPont Offers New Pesticide

Mites, the tiny eight-legged pests that cost American orchardists millions of dollars every year, will be fought this year with a new chemical weapon, the latest development

Pittsburgh Agricultural Fungicides



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A safer, better seed protectant

Pittsburgh Spergon-sl is a non-metallic organic chemical fungicide . . . a highly effective protectant against the harmful fungi that cause seed decay and "damping off" of plants in the early post-emergence stage. Spergon-treatment of seeds, prior to planting, largely prevents seed and crop losses, as well as delays caused by necessity for reseeding.

Best of all, it is a really *safe* protectant to use . . . *safe* for humans, for animals, and for the seed itself. It is non-irritating to flesh or to the sensitive mucous membrane of the operator. And even an over-application of it cannot harm most valuable seed. More, this dry wettable powder can be used in either the slurry method or as a dry seed treatment and will not cause sticking or clogging in seed drills. It can be safely applied, too, with legume inoculation bacteria, if used according to directions. For corn, peas, beans, alfalfa and many other seeds, *Pittsburgh* Spergon-sl is the "perfect" protectant.

Write for a bulletin giving full technical information.

* Registered trade name for tetra-chloro-para-benzoquinone

Pittsburgh Phygon-xl* . . .

a new improved fungicidal spray

Pittsburgh Phygon-xl is a highly effective spray for the control of many of the fungous diseases of fruit trees, ornamental shrubs, and vegetables. It may be utilized, also, as a seed protectant.

It is easy to use, may be added directly to the water in the spray tank and is compatible with lead arsenate, DDT, Rotenone and Chlordane.

Ask for a bulletin giving full information about application.

* Registered trade name for 2, 3-dichloro-1, 4-naphthoquinone

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of the Du Pont Company's wide pest control research, based on an organic phosphorus compound known as EPN. The new insecticide has been produced by Du Pont's Grasselli Chemicals Department and has the technical title of ethyl p-nitrophenyl thionobenzenephosphonate.

Pyrenone Catalog By U. S. Industrial

"Quick Facts about Pyrenones" is the title of an unique type of catalogue for insecticide formulators published by U. S. Industrial Chemicals, Inc., New York.

Described as a reference file of product and end-use data for manufacturers of all types of insecticides, the catalogue offers information on the Pyrenones in condensed form. Removable cards give condensed data for specific end uses, including insect control in dairies, for livestock, food processing and handling, truck crops and aerosols. One section charts the product specifications for the most commonly used Pyrenone concentrates.

Spray Rig Detergent Made by Harang

A detergent for the flushing and cleaning of agricultural spray rigs to be marketed under the trade name Nutra-Sol has been developed by Harang Engineering Co., 840 Lake St., San Francisco 18, California. Its action is two-fold. First, it neutralizes and removes all previously used chemicals which might contaminate future batches, or make inaccurate the chemical concentration desired. Second, it removes from the tank, hose and boom, the dirt, scale, rust and sediment which cause nozzle and strainer clogging, and by their abrasive action accelerate pump and valve wear.

Meridian Markets Azelea Plant Food

Meridian Fertilizer of Hattiesburg, Miss., has launched Cam-Aza a specialized fertilizer for camellias and azeleas, a formula developed with the aid of E. W. McElwee, floriculture professor of Mississippi State.

USDI Report On Drilling In Phosphate Beds

Improved methods of diamond-drilling in phosphate-bearing beds in southeastern Idaho and southwestern Wyoming, which has resulted in greater core or sample recovery, are described in a Bureau of Mines publication released by Director James Boyd.

Using more efficient drilling practices and tools, the Bureau recovered an average of 82 percent of the core from the 11 holes drilled in the phosphate beds, the report points out. From this improved core recovery—from 20 to 50 percent greater than standard drilling in the past—beds in the area most suitable for mining and processing can now be determined more accurately, it adds.

The publication, Report of Investigations 4597, "Experimental Diamond Core-Drilling in the Phosphoria Formation in Southeastern Idaho," was prepared by Albert E. Long, Bureau mining engineer, Mount Weather, Va.

A copy of the publication may be obtained free from the Bureau of Mines, Publications Section, 4800 Forbes Street, Pittsburgh 13, Pa. It should be identified by number and name.

Band-Labels Now Stick on Burlap

The paper band label which has been in common use for years on cotton sacks has now been successfully adapted to heavy burlap bags. Quaker Oats, working in cooperation with Bemis Bro. Bag Co., have proven by a series of carefully supervised test shipments that the new label will arrive in excellent condition. It supplies a brighter label, due to the improved printing surface.

International Paper Opens Denver Branch

The Bagpack division of International Paper has opened a branch sales office in Denver, Colorado, with Russel A. Gair as district sales manager. It is their sixteenth district sales office.

Reserve Rooms Now For NFA Convention

NFA's convention is scheduled for June 12-14 at The Greenbrier Hotel, White Sulphur Springs, West Virginia. Here it is March . . . and high time to start making your reservations.

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OUR LAND

(Continued from Page 54)

share-cropping, a form or tenancy dating back to the readjustments between land owners and former slaves in the period following the Civil War. Share cropping which even now encompasses 38 per cent of all farm tenants in the region, was encouraged because it was relatively easy to divide traditional crops like cotton and tobacco and much more difficult to account for and allot the respective share of less easily divisible products. In this way the system has tended to penetrate the one-crop economies that have traditionally characterized the cotton and tobacco areas of the South. We still have an established pattern for dividing the shares of such commodities as livestock, grazing crops, vegetables, poultry, fruits, and dairy products, despite the fact that the increased production of these commodities is the very heart of successful farm diversification in the region. In the main, landlords and tenants have hesitated to depart from the conventional crops because they have had no standards to guide them in prorating their respective parts of the newer commodities. There is a great need for developing a method of distributing income from all types of farm operations on a basis that will be fair and acceptable to both parties to remove a handicap that is affecting a greater diversification of agriculture.

Another great difficulty of the tenancy system is the constant moving from one farm to another of a large part of the tenant population. In Georgia, for instance, it is estimated by reliable authorities that half of the farm tenants move annually. This instability stems from a feeling of insecurity. Few tenants hold written leases, and it is relatively rare for any agreement to run over a year. Under such conditions there is a small inducement to farm efficiently for the long-run period. And notwithstanding the fact that modern farming operations call for extensive crop-rotation practices extending over periods of two to five years, there is little incentive to develop a permanent home or to take a long-run interest in the land that is being operated. Too often the tenant considers it to his interest "to skin" the land, or mine it of its fertility to gain the greatest possible return in a short time. Because of the high degree of impermanence the tenant is not interested in planting legumes and grasses or winter cover crops or in installing protective devices to guard the land against erosion, because the chances are he will move away before he can gain any benefits from his efforts. Furthermore, the tenant has little interest in the farm buildings and facilities which he uses, and these often are allowed to deteriorate at a rapid rate. There is abundant evidence of the effects of this neglect in nearly every part of the Southeast.

Correction of the Problems of Tenancy

Under the conditions which now characterize the majority of owner-tenant relationships both sides are penalized—the owner by a constantly diminishing crop-producing power of his land and the tenant by a feeling of insecurity on the land he operates. It is not likely that this unprofitable situation can ever be changed satisfactorily under traditional relationships. It does seem possible, however, that some of the undesirable aspects of tenancy can be corrected by written agreements between landowners and land operators based on a program of sound farming practices and extending over a sufficient number of years to assure both parties of fair and profitable returns. Such a change will assure the tenant that he will be on the land long enough to derive assured benefits from conservation farming and will thereby instill in him the much needed sense of security and stability. On the other hand the landowner will stand to gain more in the long-run than the tenant, because it is **his** property which is being rehabilitated and conserved. For this reason initative to put into operation the new type of agreements should come from the landowners, and they should be encouraged to take the leadership in this instance. Admittedly much persuasion and educational work will be required to induce owners to make the needed shifts in their relations with tenants, but with enough effort it can be done eventually. Generations have come and gone while the present situation was developing, and the whole picture cannot be changed over night. It will take time and experience by the most foresighted owners to demonstrate that new

NFA offers a set of posters, of which this is an example, which they are selling. Send for samples and price list.

relationships can be made to work successfully.

Conclusion

From this brief discussion of the problems of land rehabilitation it is evident that the businessman and the general public have an interest in soil conservation. But it is also clear that the person most affected is the farmer. He lives upon the land and draws his substance from it. The major responsibility of maintaining the priceless heritage of the land devolves upon him. If he is to merit the interest and support of the businessman in meeting his problems, he must be aggressive in his own behalf.

From two decades of experience experts have learned the most effective ways and means for stopping erosion and for building up the land. This information is available to all, and a farmer can learn to practice some sort of conservation even if his only cultivating equipment is a mule and a few implements. Conservation and sound management of farms will pay increased returns just as surely as neglect and misuse of the land bring decreased returns.

The Committee does believe, however, that educational leadership of both State and Federal agencies in the field of conservation should be continued and intensified. It believes the technical work and goals of both groups are laudable and that they merit the praise and support of the general public and of businessmen in particular.

ARKANSAS

(Continued from Page 22)

future expansion is already proving wise. Soon a warehouse adjacent to the main plant will go under construction.

This warehouse will be a distributing point for insecticides, feed, and supplies that can be picked up conveniently by farmers who come to the plant for fertilizer.

The entire output of the plant is sold through the Arkansas Farmers Association, which has placed G. M. Measles in charge of sales and procurement of supplies. Mr. Measles has his office at the plant.

Before distribution began, stockholders and the Arkansas Farm Bureau, which also sponsors the plant, held a joint meeting to designate dealers in the 75 counties of the state. Now 400 dealers distribute the fertilizer, besides the county cooperatives.

Plant management is under the supervision of the elected officers as follows: Ralph Hudson, Harrison, Ark., president; Joe C. Hardin, Grady, chairman of board; Joe S. Reed, Springdale, vice-president; Walter D. May, Jr., Marion, 2nd vice-president; Elmer T. Miller, Little Rock, Secretary-treasurer. Directors are Raymond Frey, Paragould; Harry Goforth, Fayetteville; Dana Reynolds, Gravette, and C. W. Sheldon, Ozark. Clifford L. Smith is executive manager, and M. D. Bradfield, general manager. All key men in the operation of the plant are experienced fertilizer men who understand thoroughly the needs of farmers in the area.

Now that the plant is in full operation, farmers throughout the state, whether or not they are stockholders in the plant, can buy its fertilizer, under the trade name of Arkansas Farmers Quality Fertilizer.

Manager Broadfield pointed out the fact that the central location of the plant gives it a strategic position for serving every part of the state.

The Arkansas Farmers Association, only four years old, has grown as much during its short existence as most businesses grow in twelve or fifteen years. Thirty-two County Co-operatives are affiliated with the state association. The combined net worth of these county co-ops is $2,000,000.

The program of the Associa-

POTASH MINES RESUME PRODUCTION . . . Despite the strike which halted production at the three big Carlsbad, New Mexico, potash mines, 60 days ago, and has threatened a national potash shortage, 9 cars of the mineral left Carlsbad January 17 to be processed into fertilizer for the farms. The Carlsbad area produces 85 per cent of the nation's potash. A federal injunction against the striking International Mine, Mill and Smelter Workers Union has brought a back to work movement and production is rapidly returning to normal. On hand to see the cars of potash leave Carlsbad over the Santa Fe tracks were the plant managers of the three Companies, (left to right) P. S. Dunn, Potash Company of America, Nelson White, International Minerals and Chemical Corporation, and Henry H. Bruhn, United States Potash Company.

tion, which includes the handling of only those items that go into the cost of production, such as feed, seed and fertilizer, has the support of the Arkansas Farm Bureau Federation's 40,000 members.

The farmers who pooled their money to build their modern fertilizer plant buy their fertilizer at competitive prices, but they will profit from dividends paid on their investment in stock. Now they can buy any amount of fertilizer they wish, either bagged or in bulk.

BROCHURE

(Continued from Page 21)

it is now essential that we prevent erosion and avoid further depletion of our soil . . . Had it not been for the fertilizer industry . . . the soil in vast regions of our Nation would have become useless and abandoned . . . in the years ahead we know the need for more and better fertilizers will become greater and more urgent.

A. J. McFadden, president, National Council of Farmer Cooperatives, supplies these quotes: "... the work of the Farm Extension Service has been a greater factor, but so also has the aggressive work of the manufacturers of our staple commercial fertilizers. The complete standardization of their product makes the farmer certain he is getting full value for his outlay and that the results he expects from a given application will be forthcoming . . . America will be feeding its own people from its own soil from now on."

There follows a series of sectional reports. Firman E. Bear, New Jersey AES soils department chairman, leads off on the East, which, he points out, is the pilot operation for the rest of the Nation, the guide to tomorrow's practice in the areas further West.

Emil Truog, U of Wisconsin soils department chairman, follows on the subject of the mid-West. W. E. Colwell, N. C. State department of agronomy head, discusses the South. W. T. McGeorge, Arizona AES director, handles the West.

And that's the book. As we said in the beginning—all we can do here is whet your appetite for it. We have read every word, and gained a great deal from the reading. You will, also—and you will find it a ready and well-planned source of data for all your work in promoting recognition of fertilizer and the fertilizer industry among your neighbors.

REPORT TO CONTRIBUTORS ON RADIOACTIVE AND TAGGED ELEMENT RESEARCH BY INDUSTRY COMMITTEE

To all Contributors:

A detailed statement on receipts and disbursements of the Industry Committee on Radioactive and Tagged Element Research is attached.

When we began soliciting the industry for contributions to the 1949-50 research program we had a balance on hand from the previous year of $563.72. Total contributions received for 1949-50 amounted to $22,800. We have already disbursed $20,000 to the several colleges and Experiment Stations. The Committee purchased 500 copies of the special issue of "Soil Science" containing results of radioisitope research and distributed copies to Experiment Stations and to Dr. F. W. Parker for further distribution. At this date we have on hand a balance of $3,118.72.

It is hoped a Committee meeting can be arranged at some convenient time soon, to be held either in Washington, D. C., or at Beltsville conjunction with Dr. Parker's staff and some of his regional leaders on this radioactive research program.

Program of Radioactive Experiments for 1950

The scope and general nature of the field experiments for 1950 can be appreciated from the following brief summary.

Location: in 20 states and Canada, 39 field experiments.

Objectives: comparison of sources; of degree of ammoniation; the residual value of previous fertilizer application; time and rate of application; fertilizer placement; effect of liming and soil ph; effect of soil moisture; effect of nitrogen fertilization; and comparison of crops.

A total of 290 lbs. of P_2O_5 and 26.4 curies of radioactive phosphorus P32 will be prepared and supplied to the experimenters by the U. S. D. A., Bu. Plant Industry, Soils and Agr. Engineering at Beltsville.

The states where experiments are to be conducted: Alabama, Arizona, Colorado, Georgia, Idaho, Indiana, Iowa, Maine, Michigan, Minnesota, Mississippi, North Carolina, Ohio, Oregon, South Carolina, Texas, Utah, Virginia, Washington, Wisconsin, and Saskatchewan, Canada. In addition, the Bureau of Plant Industry at Beltsville will sponsor special greenhouse and laboratory studies at the Colorado and Iowa Agricultural Experiment Stations.

You will agree that this is a most comprehensive program which involves nearly every important phase of phosphorus fertilization.

Sincerely yours,

V. Sauchelli, Chairman
Industry Committee
on Radioactive and Tagged
Element Research

Contributors to 1949-50 research:

American Cyanamid Company, Armour Fertilizer Works, The Baugh & Sons Company, The Consolidated Mining & Smelting Company of Canada, Consolidated Rendering Company, Cooperative G. L. F. Exchange, Inc., The Davison Chemical Corporation, Eastern States Farmers' Exchange, Georgia Fertilizer Company, International Minerals & Chemicals Corp., Knoxville Fertilizer Company, Mathieson Chemical Corporation, Mutual Fertilizer Company, Naco Fertilizer Company, Northern Chemical Industries, Inc., Reading Bone Fertilizer Company, Robertson Chemical Corporation, The Smith Agricultural Chemical Company, Smith-Douglass Company, Inc., Southern Fertilizer & Chemical Company, Swift & Company, Tennessee Corporation, Texas Gulf Sulphur Company, I. P. Thomas & Son Company, Virginia-Carolina Chemical Corporation.

Disbursements to:

Cornell University Agr. Experiment Station, Maine Agricultural Experiment Station, North Carolina Agr. Experiment Station, Georgia Agricultural Experiment Station, Colorado Agricultural Experiment Station, Arizona Agricultural Experiment Station, Idaho Agricultural Experiment Station, Iowa State College.

SOME FUNDAMENTAL FACTS

About Fertilizer

By Alvin M. Banthin

In recent years so much has been written concerning the role of legumes in soil improvement, that many farmers have been led to rely too much on the production of these crops to maintain soil fertility. Where the stand is good and where a legume makes a good growth, it builds up the soil with respect to organic matter and nitrogen but adds nothing in the way of minerals. All the minerals in the crop comes from the soil and, when the crop is plowed under, are returned to the soil.

One reason why legumes make good feed is because they contain such a high percentage of minerals. A ton of average alfalfa of clover hay, for example, contains about 10 pounds of phosphoric acid and 40 pounds of potash and enough calcium and magnesium to be equivalent to 90 pounds of pure limestone. There is twice as much potash and about 10 times as much calcium and magnesium as is contained in timothy hay. A three-ton crop of alfalfa hay, therefore, would remove from the soil as much phosphoric acid as would be contained in 150 pounds of 0-20-20 fertilizer and as much potash as would be contained in 600 pounds of the same fertilizer.

On soils where the quantity of phosphoric acid and potash available for plant growth, in any one season, is less than the amount needed by the crop, these elements must necessarily become limiting factors and yields will be curtailed. Thus, the quantity of feed produced would be decreased, the mineral content of the feed would be lowered, and the value of the crop as a builder of organic matter would be lessened. For this reason, soil-building crops cannot "build" unless they are well-supplied with the mineral nutrients necessary for their growth.

A number of experiments have been conducted at the Experiment Station at the Michigan State College in an effort to learn the results produced when fertilizers were properly applied and selected on the basis of the crop requirements and the nature of the soil type on which the crop was grown. These experimental results, obtained during recent years, showed that the yield and soil-building value of many legumes were greatly increased.

Plants inadequately supplied with nutrients may fail to develop or they may develop abnormally if the soil is deficient in certain essential elements. For example, a lack of available phosphorus in a soil under legumes results in slow growth and retarded seed production. There are no definite leaf symptoms which may be safely used for diagnostic purposes, but if growth is slow and both the soil and the green plant test low in phosphorus, it is likely that the supply of phosphorus is inadequate. This would be a safer assumption on heavy than on light soil.

Potash deficiency is often indicated by definite leaf symptoms which may be safely used. White beans and soybeans, for instance, first show evidence of potash deficiency by a yellowing of the tips and edges of the leaflets. The yellowing then progresses toward the center and base of the leaflets, and the tips and edges gradually turn brown. The yellowing is usually accompanied by a crinkling of the leaflets. If such plants are treated with potash soon after the first symptoms appear, the new leaves come out and reach maturity without exhibiting the characteristic yellowing. The affected leaves, however, do not recover.

Potash deficiency in clover and alfalfa is also indicated by a yellowing of the leaf tips and edges but may be preceded by the appearance of small white dots near the edges of the leaves.

In conducting their experiments, some alfalfa plants were grown in the greenhouse on a type of soil known here in Michigan as Plainfield sand which is deficient in potash. These plants did not develop far before the typical potash deficiency symptoms were shown—yellowing at the tips and along the edges of the leaflets with rows of white dots between the yellow and green areas. On the other hand, the plants that were grown on the same soil, but treated with potash, were perfectly normal in color.

Soils deficient in boron for some crops are rather widespread in Michigan. When boron is lacking in the soil, or is not available, the leaves of the alfalfa and the clovers turned a red or bronze color on the under side and near the tips. From there the color spreads to the entire leaf, which finally turns yellow and dies. At times, and on some fields, the yellowing is more noticeable than the reddening. The younger portions of the plant are first affected. The internodes of the new growth are shortened. This gives a characteristic rosetting along with the abnormal color. Work is in progress in Michigan to determine the advisability of including borax in the fertilizer for alfalfa and clovers.

The experiments conducted at the Michigan State College have shown that fertilizer usage for legumes vary with the different crops and with different soils. Heavy soils, for example, usually needs some potash but are chiefly lacking in phosphoric acid. Sandy soils may also be deficient in phosphoric acid, but the first limiting factor is very likely to be potash. Variations in management methods also make necessary differences in fertilizer usage on the two classes of soils.

On heavy soils, alfalfa and clovers are usually seeded with a small grain companion crop. Thus, it would be rather difficult to apply one kind of fertilizer for the legumes and still another for the grain since both crops must be supplied on one fertilizer application.

Many good stands of alfalfa fail to come through the first winter. This is generally due to lack of vigor as a result of competition from the companion crop or a shortage of nutrients in the soil. Fertilizers greatly stimulate the early growth of this crop. This was demonstrat-

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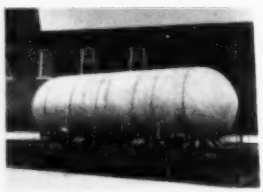
ed on a Miami silt loam in Tuscola County—in the thumb of Michigan—where barley was fertilized in the row with 25 pounds of 4-16-4 fertilizer. Alfalfa seed was scattered broadcast ahead of the drill. The plants growing directly in the barley rows, 50 days later, was several times larger than the plants growing between the barley rows. It is easy to imagine that the larger plants were more vigorous in the fall and were more likely to survive the winter than were the small plants. The plots which received the 4-16-4 per acre as compared to a yield of 2,768 pounds per acre on unfertilized land.

An experiment conducted on Wisner silt loam gave a good showing as to the effect of fertilizer on a stand of alfalfa. An application of five hundred pounds of 4-16-8 fertilizer was applied to the previous wheat crop. This caused an increase in yield of 3,390 pounds of dry alfalfa per acre. So large an increase in yield would not have occurred, if there had been a good stand of alfalfa on the unfertilized plot.

Increases in yield, however, do not always come as a result of improved stand but often as a result of a more luxuriant growth. This was true on the Ferden farm where alfalfa was seeded each spring as a companion crop with wheat. The type of soil was Brookston silt loam, and five fields were used in the experiment. The fertilizer used in the first field was 0-16-0, applied at the rate of 250 pounds to the acre. The average yield was 3,939 pounds. The second field also received an application of 250 pounds, but the fertilizer used was 0-16-10. Here the average yield increased to 4,227 pounds. On the third field 0-16-0 fertilizer was again applied, but the rate per acre had been doubled. This made an average yield of 4,926 pounds. When the application of 0-16-10 fertilizer was doubled in the fourth field, the average per acre yield was 5,502 pounds. The fifth field remained an unfertilized plot, and the average yield dropped 907 pounds that of the first field. These results show that fertilizers are a very profitable investment, even if all of the fertilizer cost is charged against the alfalfa.

The growth of June, or red clover is also greatly stimulated by applications of commercial fertilizer. On another farm in Tuscola County, an application



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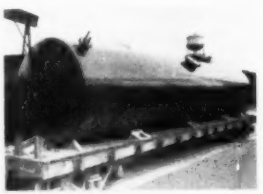

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8'-6" Diameter x 38'-6" Long
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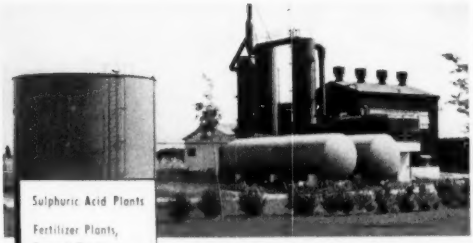

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of 250 pounds of 4-16-8 per acre for oats increased the yield the following year from 2,045 to 3,012 pounds per acre. In another field on the same farm a 4-16-4 fertilizer increased the yield from 3,885 to 5,802 pounds per acre. The soil in the latter field was Conover silt loam. Fertilizer not only increased the yield of this clover but caused it to mature earlier. As an illustration of this, a data recording was made on June 12, almost a month before the harvest was made. On that date the fertilized clover was fully blossomed, but that which was unfertilized had not started to blossom.

On the better sandy loams well supplied with organic matter and lime, it is possible to seed alfalfa with a small grain nurse crop as is customary on heavy soils. Where this practice is followed, however, it is advisable to make a light seeding of the grain and to use a fertilizer which will favor the alfalfa, unless, of course, one is more interested in the grain. For instance, on a limed Berrian sand in Lenawee County, alfalfa was seeded in the early spring in wheat. Where the wheat had received 250 pounds of 0-16-8 fertilizer, the yield increase caused by the fertilizer was 5.5 bushels per acre, and the alfalfa yielded 2,391 pounds more than where fertilizer was not applied. In contrast to these figures, the yield increase on the plot which received 500 pounds of 4-16-8 was 23.0 bushels of wheat but only 1,217 pounds of alfalfa. The smaller increase in the case of alfalfa was because of the poor stand resulting from competition by the very heavy wheat crop. Apparently the soil needed nitrogen for wheat, but the heavy straw growth was fatal to the alfalfa. As the alfalfa was left only one year, the farmer made more money by the larger wheat crop, but if the alfalfa had been left two or three years, the advantage of using a fertilizer favorable to the alfalfa would have been considerable.

According to information from the Agricultural Experiment Station of the Michigan State College, it is better to seed alfalfa alone on light sandy soils, because better stands are obtained and more hay is produced in two years than would be produced in three years from a poor stand obtained by seeding in a companion crop.

Minor Elements Given Special Attention at Maryland Conference

Minor elements were discussed at the morning session of the Maryland Fertilizer Conference, held at the University at College Park, February 3. Those who attended the meeting heard papers which pointed out, among other things, that various minor elements are not deficient in most soils, that for the present each case should be considered separately and that any remedial procedures should be undertaken with great care since applications in excess of the small quantities required may result in toxic conditions. With I. C. Haut presiding, the following were the speakers and their subjects: H. G. Gauch, "Role of Minor Elements in Plants"; O. E. Street, "Importance of Minor Elements in Field Crops"; L. E. Scott, "Minor Element Nutrition of Fruit and Vegetable Crops"; and R. P. Thomas, "The Use of Minor Elements in Fertilizer."

At the afternoon meeting presided over by A. O. Kuhn, R. Q. Parks spoke on "Fertilizer Use and Irrigation"; S. E. Day on "Efficient Crop Production; the

(Continued on Page 70)

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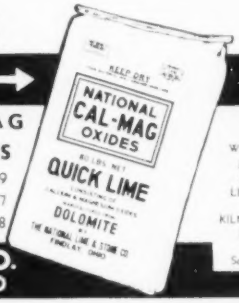

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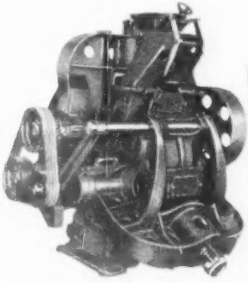

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MARKETS

ORGANICS: Organics for fertilizer use continue in extremely tight position with producers of domestic Nitrogenous Tankage sold up through April. Prices for domestic Nitrogenous are nominally $4.00 to $4.50 per unit of Ammonia in bulk f.o.b. production point. No offerings of foreign Nitrogenous are in the market.

CASTOR POMACE: All producers are in a sold up position and the price is nominally $30.50 per ton in bags f.o.b. Northeastern production points. Movement is against existing contracts.

DRIED GROUND BLOOD: Chicago market is reported at $6.50 to $6.75 per unit of Ammonia in bulk f.o.b. Chicago area. The New York market is around $7.00 per unit.

POTASH: Production is steadily increasing but the Carlsbad plants are not yet at full capacity. Demand for Potash continues greater than the available supply.

GROUND COTTON BUR ASH: This source of Carbonate of Potash continues in active demand and producers are heavily sold. Price is currently 65¢ per unit of K$_2$O Potash in bulk f.o.b. Texas shipping point, for material testing 30-40% K$_2$O.

SUPERPHOSPHATE: Movement of Superphosphate from producers is increasing as the fertilizer mixing season progresses. Stocks continue adequate and prices firm.

PHOSPHATE ROCK: Domestic shipments are showing improvement as stocks of Superphosphate move out from acidulators' plants. Prices continue firm.

SULPHATE OF AMMONIA: Demand for this product is increasing and production of coke oven material is expected to be diminished by the coal strike. However, supplies of synthetic material continue adequate for the current demand. Prices range from $45.00 to $48.00 per ton f.o.b. production point.

NITRATE OF SODA: Stocks continue adequate and movement seasonal. No change in prices has been noted.

AMMONIUM NITRATE: Demand continues steady and producers are in a well sold position.

GENERAL: Organic Ammoniates continue tight. Superphosphate supplies continue adequate and movement increasing. Potash continues short of demand in many areas.

FERTILIZER TAX TAG SALES AND SHIPMENT TONNAGES
(In Equivalent Short Tons)
Compiled by The National Fertilizer Association

STATE	January		Fiscal Year Cumulative July-January	
	1950	1949	1949-50	1948-49
Virginia	83,260	90,767	271,688	281,673
N. Carolina	86,070	307,328	276,822	771,266
S. Carolina	157,950	173,454	358,094	409,394
Georgia	149,329	131,695	366,542	391,658
Florida	138,723	115,793	607,352	463,967
Alabama	41,839	88,085	207,356	274,449
Tennessee	16,084	26,229	117,127	167,801
Arkansas	16,915	28,776	84,333	117,184
Louisiana	19,631	27,638	76,075	97,059
Texas	40,354	49,968	256,003	259,274
TOTAL SOUTH	750,155	1,039,733	2,621,392	3,233,725
Indiana	98,375	96,532	503,794	603,607
Kentucky	57,415	88,355	223,462	299,684
Missouri	77,504	67,881	245,488	253,637
TOTAL MIDWEST	233,294	252,768	972,744	1,156,928
GRAND TOTAL	983,449	1,292,501	3,594,136	4,390,653

TAX TAG SALES DOWN

Combined figures covering fertilizer tax tag sales and reports of fertilizer shipments by manufacturers in 13 Southern and Midwestern States during January, totaled 983,449 equivalent short tons, according to a compilation prepared by The National Fertilizer Association.

The January figure represents a decline of approximately 300,000 tons, or 24 percent, from the corresponding total recorded for the same month last year, and reflects a drop of 28 percent in the South and of 8 percent in the Midwest. Among the individual States whose figures provide the basis for the compilation, the largest decline—from 307,000 tons in January 1949 to 86,000 tons in January 1950—took place in North Carolina. A substantial part of the decrease in this figure, however, may be a reflection of the change in North Carolina's fertilizer control program which went into effect late in 1949. Under the old law some manufacturers bought enough tags during January to take care not only of January sales but also of anticipated later business; this practice would tend to inflate the January figure at the expense of figures for later months. Figures

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obtained under the new program, requiring as it does monthly reports of actual fertilizer shipments, would tend to reflect January sales only and would therefore be comparatively smaller than those based solely on tax tag sales.

Substantial declines in equivalent tonnage were also reported by Alabama, Tennessee, Arkansas, Louisiana and Kentucky, but four of the States—Georgia, Florida, Indiana and Missouri—reported greater tonnages this January than last.

During the first seven months of the current fiscal year, a total of 3,594,000 equivalent short tons have been recorded. This figure is approximately 18 percent below the comparable 1948-49 total which amounted to 4,391,000 tons. The Southern States' total is down 19 percent, while that of the Midwest dropped 16 percent. Only one of the States—Florida—reported an increase in January-July 1950 tonnage over that of the same period a year earlier.

DOW MAN FINDS SEED THAT FERTILIZES

By Bob Gray

Handley examines some of the thousands of Chinese tallow seedlings planted last year near Angleton, Texas, and harvested in January. Some grew six feet in eight months.

A home-grown fertilizer, produced by a tallow tree, has resulted from some extensive experimentation by a research chemist in Freeport, Texas.

Melvin Handley, of the Dow Chemical company, claims that the familiar Chinese tallow tree is a healthy and prolific producer of Stillingia seed, which Handley describes as the source of a potentially high-protein fertilizer.

Ten years of part-time home research has convinced Handley that, when pulverized, the tallow tree seed is capable of aiding most standard field crops or garden plants with its 12 per cent Nitrogen content.

Using only a simple clothes wringer and meat grinder, Handley has extracted a 75 per cent protein meal from the kernel of the tree's seed. Although this is too "hot" for most fertilizing purposes, Handley's experiments are said to show that running the whole seed through a grinder turns out a 15 percent protein mash which is ideally suited to nearly all types of soil.

As a full-time research work-

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er in several phases of Dow's huge Freeport plant, Handley's professional activities cause him to take a long-range, optimistic view of the tallow tree and its potentialities. He foresees that the tree may one day be grown commercially not only for the fertilizer industry but for other applications it has in the paint, plastics, and cosmetics fields.

However, farmers now putting out test plots of Chinese tallows—and many are doing it in south Texas because of Handley's experiments—have been advised that their first produce need not go to waste, that it becomes fertilizer with very little effort.

"I've found that a mature tree will produce about fifty pounds of seed," Handley explains, "and that the seed from seven or eight trees will, when ground up, fertilize about one acre of ground."

A fast-growing, hardy specimen, the Chinese tallow starts maturing after four years, although it produces some of its three pod seeds after a year's growth. Handley is currently developing a four and five pod seed to step up its output.

His test plantings near Angleton, Texas produced about 20,000 tallow seedlings early this year, and he has distributed them throughout the Texas-Gulf coast area. Requests for seeds and information are still coming in, he adds.

"My experiments with this thing are still not finished," he makes plain, "and it'll be quite awhile before there's any chance of a market developing for the seed."

But Handley—to whom Chemurgy is a fascinating hobby—is confident the seed has a great amount of untapped energy that may one day be utilized on a widespread commerical and industrial and agricultural scale.

Maryland

(Continued from page 66)

Fertilizer Dealer and the County Agent"; and S. F. Thornton on "Problems in Fertilizer Formulation."

Many fertilizer manufacturers, salesmen and dealers, and others interested in fertilizers and their use in Maryland, attended.

SOUTHERN STATES PHOSPHATE and FERTILIZER CO.

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Manufacturers of

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EXPORT ORDERS SOLICITED

Just at Press-Time

A round-up of news in the mail as we go to the printer with this issue . . briefed, for quick reading.

The main building of the International Minerals and Chemical Company plant at Texarkana, Arkansas, was destroyed by fire early on February 23, with a loss of many thousands of dollars covered by insurance. Smaller nearby structures were saved, including the warehouse and office.

Maurice H. Lockwood, vice president in charge of the plant food division, has already announced reconstruction of the building to incorporate the latest improvements the company has devised for the modernization of its fertilizer plants.

The Coronet Phosphate Co., Plant City, Florida, is moving its mining operations to a 3,000 acre site near Lakeland according to vice president B. G. Dabney. The new mine will be known as Tenorac--which is Coronet spelled backward. 65 to 70 men will be employed.

Chipman Chemical will soon start construction in Pasadena, Texas on a $250,000 plant for production of insecticides and herbicides. It is expected to be in operation by the end of the Summer.

CLASSIFIED ADVERTISING

For Sale, Exchange and Wanted Advertisements, same type now used, EIGHT CENTS a word for one insertion; TWELVE CENTS a word for two insertions; FIFTEEN CENTS a word for three insertions, and FOUR CENTS a word for each insertion more than three; ADVERTISEMENTS FOR THIS COLUMN MUST BE PAID IN ADVANCE.

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THE strategic factory locations of The American Agricultural Chemical Company, as shown on the accompanying map, assure prompt, dependable service for the complete line of products listed below.

We manufacture all grades of Commercial Fertilizers, Superphosphate, Agrinite Tankage, Bone Black, Bone Black Pigments (Cosmic Black), Bone Ash, Bone Oil, Dicalcium Phosphate, Monocalcium Phosphate, Gelatin, Agricultural Insecticides (including Pyrox, Arsenate of Lead, Calcium Arsenate, etc.), Trisodium and Disodium Phosphate, Phosphorus Elemental, Phosphoric Acid, Sulphuric Acid, Ammonium Carbonate, Ammonium Fluosilicate, Magnesium Fluosilicate, Potassium Fluosilicate, Phosphorus Pentasulphide, Phosphorus Sesquisulphide, Ferro-phosphorus, Red Phosphorus, Zinc Fluosilicate, Salt Cake; and we are importers and/or dealers in Nitrate of Soda, Cyanamid, Potash Salts, Sulphate of Ammonia, Raw Bone Meal, Steamed Bone Meal, Sheep and Goat Manure, Fish and Blood. We mine and sell all grades of Florida Pebble Phosphate Rock.

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Charleston, S. C.
Cincinnati, Ohio
Cleveland, Ohio
Detroit, Mich.
Fulton, Ill.
Greensboro, N. C.
Havana, Cuba
Henderson, N. C.
Montgomery, Ala.
Nat. Stockyards, Ill.
Norfolk, Va.
No. Weymouth, Mass.
Pensacola, Fla.
Pierce, Fla.
Port Hope, Ont., Can.
Savannah, Ga.
Searsport, Maine
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Pierce, Fla.
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Savannah, Ga.
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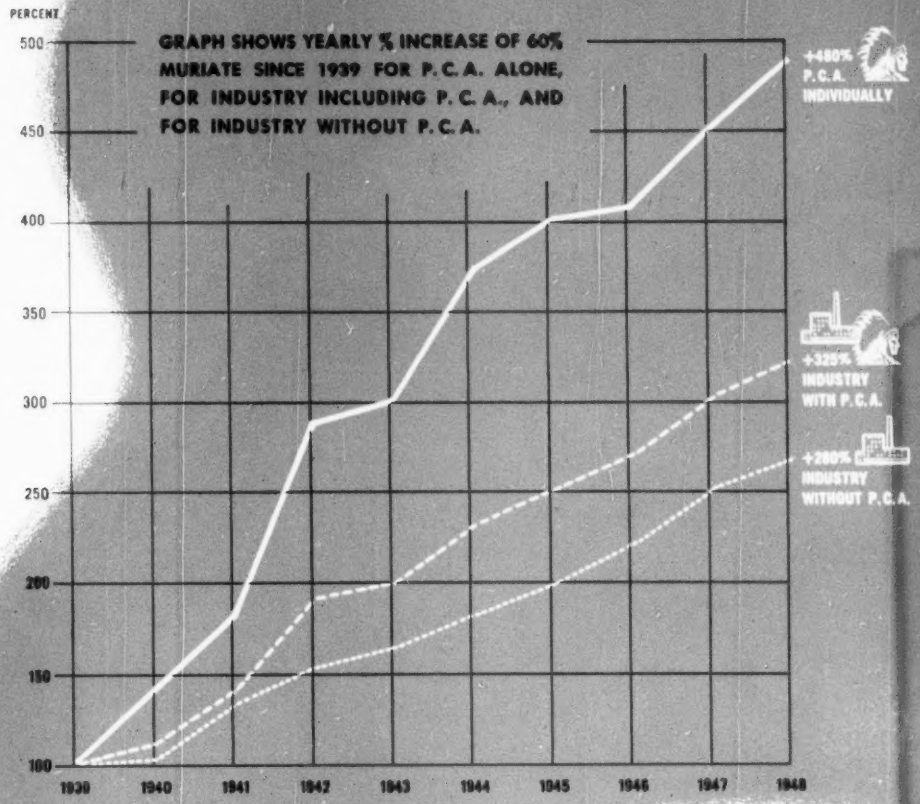
We've been doing some figuring...



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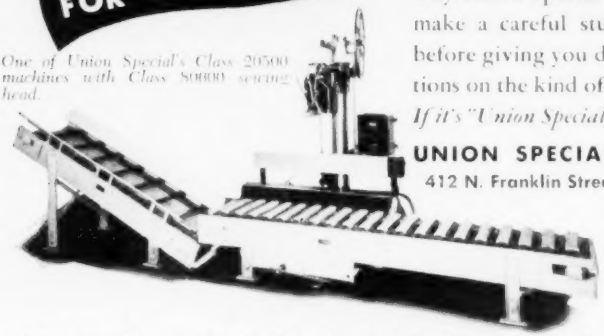

One of Union Special's Class 20500 machines with Class 50800 sewing head.

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